American Fruit Grower

FEBRUARY • 1952

PROGRESS IN SPRAYING

This Illinois Farmer Says:

"I CAN ALWAYS DEPEND ON FIRESTONE OPEN CENTERS TO TAKE ME THROUGH"

MORE AND MORE OPEN CENTER BUYERS *Choose* Firestone CHAMPIONS

"I farm 240 acres of black loam, and I've found that there are times when I need tires with extra traction to get my work done. I choose Firestone Open Centers for my farm, because they have the traction that will always take me through. In my opinion they're the best tractor tires a farmer can use."

LAWRENCE O. LARSON
ORION, ILLINOIS

THERE'S only one sure way to tell the difference between tractor tires, and that is to put them to work. On any job, you can soon see that the Firestone Champion Open Center outpulls all other open center tires.

From the tractor seat you'll soon see *why* it outpulls all other tires. It's the only open center tire with Power-Arc traction bars, tapered and curved to take a full-traction bite deep into the ground. And it's the only tire that is designed to cup the soil for a stronger grip and give positive cleaning as well.

Of course if you are one of the million or more farmers who prefer a traction-center type of tire, be sure to get the only traction-center tire ever built . . . the Firestone Champion Traction Center.

Buy Firestone Champions for *your* tractor. You'll find them the best tires you can use.

Always Buy Tires Built By FIRESTONE, Originator of The First Practical Pneumatic Tractor Tire

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC.

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Entered as second-class matter at Post Office at Willoughby, Ohio under the Act of March 3, 1879. Additional entry at Mount Morris, Illinois

Announcing

DDT and Parathion in a new, dustless, easy-to-use, all-summer cover spray

253

NOW you can produce more clean fruit with simple, easy, one-product control of codling moth, red-banded leafroller, leafhoppers, European red mite, red spider mite, San Jose scale, Forbes scale, and similar pests.

Black Leaf 253 is big news for fruit growers! It simplifies summer spraying, by replacing other more complicated and more expensive cover spray programs with one highly-effective, low-cost product.

This superlative new spray material is Black Leaf *Tobacco Base* "impregnated" with 25% of DDT and 3% of Parathion by an exclusive process. Thus Black Leaf 253 is equipped to provide "double-barrel" control. During years of research and development, Black Leaf 253 topped all other cover spray programs tested, in TOTAL CLEAN FRUIT.

How to Use Black Leaf 253

Start your summer spray program with Black Leaf 253 and continue to use it throughout the season, as often and as long as necessary. Each application should be thorough, especially if red-banded leafroller or similar pests are a problem.

Use 2½ pounds in 100 gallons of water and repeat at the cover spray intervals recommended by local authorities. Use 2 pounds, if the interval between sprays is shorter than usual or if infestation is unusually low. Use 3 pounds, if the interval between sprays is longer than usual, or if infestation is severe.

Make such specially-timed, supplemental applications as may be recommended in your area to control apple maggot, curculio, or red-banded leafroller.

Do not use Black Leaf 253 within 30 days of harvest. When sprays must be applied to protect early varieties just before or during harvest, use 2 to 3 pounds of Black Leaf 155 *(fixed nicotine)* which leaves no undesirable chemical residue.

Dustless. There are no billowing clouds of dangerous dust, when you handle Black Leaf 253. Scientifically treated to eliminate dust, Black Leaf 253 is easy to use. As the tank is refilling, the desired quantity can be dumped into the water where the agitators disperse it quickly and uniformly.

Compatible. Black Leaf 253 is compatible with all the fungicides and other materials generally recommended in combination with DDT and Parathion, such as wettable sulphur, ferbam, etc.

Less residue. Black Leaf 253 provides excellent control with the least possible chemical residue and essentially no visible residue when the fruit is harvested.

Black Leaf 253 has been used very successfully on all important varieties of apples. When spraying McIntosh or Golden Delicious, susceptible to Parathion injury, follow recommendations of local authorities.

For additional information on Black Leaf 253 and other members of the famous Black Leaf family of pest control products, communicate with the nearest office below. Your inquiry will receive prompt attention.

Tobacco By-Products & Chemical Corporation

Richmond, Va. • Louisville, Ky. • Montgomery, Ala. • Waco, Texas • San Francisco, Cal.

DEPENDABLE PEST CONTROL PRODUCTS SINCE 1885

"CATERPILLAR" POWER PROTECTS FRUIT FROM wet weather DISEASES

"We consider our 'Caterpillar' Diesel Tractors good 'crop insurance policies' against wet weather diseases in spring! We save enough crops with the D2s to more than pay for another tractor! We use them for all types of farm and orchard work . . . pulling stumps . . . plowing . . . land preparation."

C. S. Gifford and Sons,
West Berrien Springs, Mich.

♦ When the water's ankle deep in parts of your orchard, and the ground is soft and spongy, you *really* appreciate "Caterpillar" dependability! You *know* you'll protect your grove or orchard from disease or insects, despite the weather! You *know* you'll keep your orchard program right on schedule. You have the power . . . traction . . . dependability to do more work faster . . . easier!

What makes "Caterpillar" dependability? It takes more than tracks backed by a Diesel engine! It takes manufacturing *know-how*! The same kind of *know-how* that goes into "Caterpillar" Diesel Tractors that have worked 50, 60 and as high as 80,000 hours. That's dependability!

Write your own "crop insurance" plan for the years ahead. See your Dealer about becoming a "Caterpillar" owner. If he asks you to wait, you'll know it's because other growers . . . the armed services . . . vital industries . . . need "Cat" Diesel power, too! Look forward to owning a "Caterpillar" Diesel Orchard Tractor!

CATERPILLAR TRACTOR CO., PEORIA, ILL.

Spraying mercury and wettable sulfur for scab control in the Gifford orchard

CATERPILLAR

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DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Diesel Orchard Tractors

the difference is...

Phygon*-XL the orchard fungicide

Controls: apple scab, bitter rot of apples and peaches, California blight of peaches, brown rot and blossom blight of peaches, peach leaf curl, cherry leaf spot and other fungus diseases. Phygon-XL has proved to be the most potent non-mercurial fungicide commercially available.

Results: increased yields of top-quality apples and stone fruits.

Advantages: extremely low cost per acre, very easy to apply, compatible with most commonly used fungicides and insecticides, harmless to pollen and bees.

*U. S. Pat. No. 2,349,772

Consult your local experiment station for recommended dosages, spray schedules and customary safety measures. Write for free Phygon-XL Bulletin #3 to:

UNITED STATES RUBBER COMPANY

Naugatuck Chemical Division, Naugatuck, Connecticut

manufacturers of seed protectants – Spergon, Spergon-DDT, Spergon-SL, Spergon-DDT-SL, Phygon Seed Protectant, Phygon Naugets, Phygon-XL-DDT, Thiram Naugets – fungicides – Spergon Wettable, Phygon-XL – insecticides – Synklor-48-E, Synklor-50-W – fungicide-insecticides – Spergon Gladiolus Dust, Phygon Rose Dust – miticides – Aramite.

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RESPIRATOR... your best protection against toxic insecticides Parathion, Aldrin, Dieldrin, etc.

Whenever you handle highly toxic insecticides, stay on the safe side—use these Willson Respirators designed expressly for such protection.

Write for full details on these two specially designed agricultural respirators and . . .

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WILLSON FeatherSpec® For eye hazards where side protection is not required. Weighs less than an ounce. Fits over glasses. Clear or Green Lens. $1.25 each.

AS Face Shield Full face coverage (8½" wide x 6" long) for operations requiring such protection. Visor and headgear separately replaceable. $2.25 each.

WRITE FOR LATEST AGRICULTURAL SAFETY BULLETIN to

WILLSON®

WILLSON PRODUCTS, INC.
Agricultural Department
118 Thorn Street
Reading, Pa.

FEBRUARY 1952
VOL. 72 No. 2

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Dependable Protection for Your Crops!

Genitox® Spray Powders
(Contain 50% and 75% DDT)

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(With particles of true micron fineness)

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• Reg. U. S. Pat. Off.

Two New Charts to Help You Keep Accurate Records of Your Spray Programs

- one for apples, other pome fruits
- one for peaches, other stone fruits

HERE THEY ARE—just the kind of down-to-earth, practical spray record charts you've always wanted . . . ready to tack on the wall!

They give you a handy way to record every spray application you make all season long. Each has spaces for marking down spray materials and equipment used, dosages, spray dates, insects and diseases controlled, weather conditions, etc.

Equally important, these charts will serve as an accurate, permanent record to use in planning next year's spray program.

General Chemical has prepared two types of charts for your use: one for apples, pears and other pome fruits; the other for peaches, plums, and other stone fruits. FOR YOUR CHARTS—fill in coupon below and mail today. We'll rush the charts to you so they'll be on hand early in the season. Don't delay—quantities are limited!

SEND COUPON TODAY
for your free charts!

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

YES! PLEASE RUSH ME your free spray record charts!

I need _____ for apples, etc.; _____ for peaches, etc.

Name _____

Address _____

Town _____ State _____

Approximate acreage in fruit _____

My Insecticide Dealer: _____

His address: _____ 1-2

Entered as second-class matter at Post Office at Willoughby, Ohio under the Act of March 3, 1879. Additional entry at Mount Morris, Illinois

SPRAY NuGREEN® ON YOUR APPLE TREES

FERTILIZER COMPOUND

. . . For better results with NITROGEN

- **The leaves absorb the nitrogen of "NuGreen"** quickly from foliage sprays.
- **Save labor.** Apply "NuGreen" in pest-control sprays and do two jobs in one.
- **Control nitrogen supply for a better crop.** With "NuGreen" sprays you can supply exactly the amount of nitrogen the trees need.
- **Get quick, sure response even** in dry weather when roots can't absorb nitrogen from the ground.
- **Safe for foliage and equipment.** Does not tend to burn leaves or corrode metal when used as recommended.
- **Prevent waste.** Feed your trees the nitrogen they need and no more.

"NuGREEN" Shows Promise For Other Fruits

Nine years' experience has already proved the special values of "NuGreen" sprays for apples in the East and Midwest. Spray application is now also proving useful in West Coast apple areas.

Trial sprays of "NuGreen" now show promise also for peaches, pears, cherries and prunes. For these fruits, however, only small-scale grower tests are advised until exact spray recommendations can be developed.

Use of "NuGreen" in irrigation water has likewise proved effective for many fruits, including strawberries, citrus and others.

ASK YOUR DEALER *for recommended spray schedules and how to use "NuGreen" on apples. Ask your fertilizer dealer also for booklets describing uses of "NuGreen" that have special advantages for certain other crops.*

Polychemicals Department

E. I. du Pont de Nemours & Co. (Inc.)

Wilmington, Delaware

DU PONT

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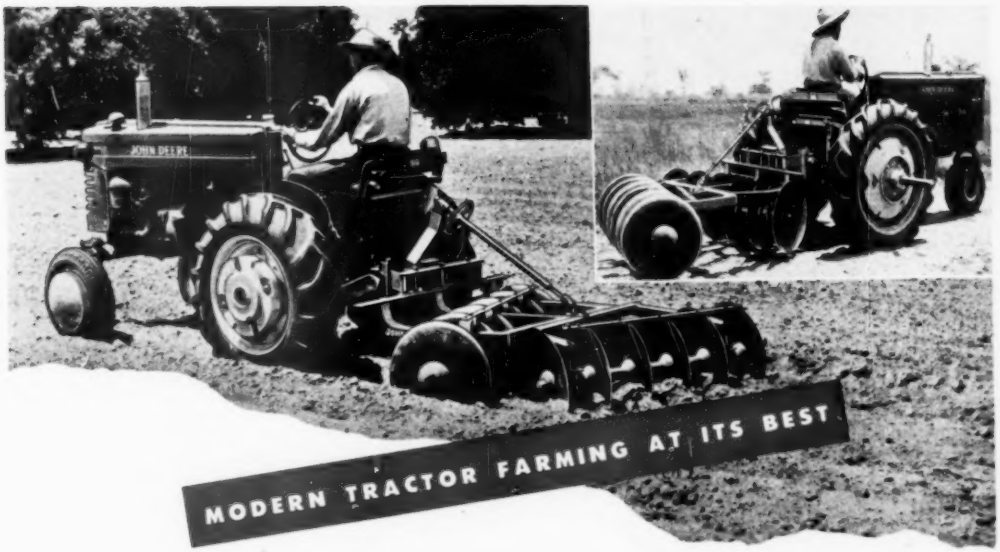
NuGREEN®

FERTILIZER COMPOUND

BETTER THINGS FOR BETTER LIVING

. . . THROUGH CHEMISTRY



The "Pick Up and Go" Way...

WITH JOHN DEERE "M" SERIES TRACTORS AND QUIK-TATCH WORKING EQUIPMENT

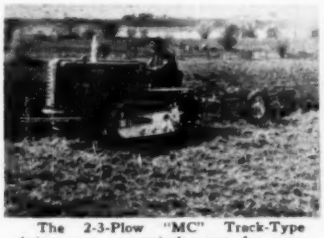
How quick! How handy! That's what owners say when referring to the new speed and ease of farming with John Deere "M" and "MT" General-Purpose Tractors and their popular Quik-Tatch working tools.

The combination of the TOUCH-O-MATIC system of lifting and controlling tools and the quick-easy method of attaching tools represents advanced tractor farming at its best. These two features make it possible for you to spend more of your time working and less time getting ready to work.

And remember, when you own an "M" or "MT," you have all these advantages combined with the economy, dependability, and ease of servicing which only a John Deere *two-cylinder* tractor can give you. Talk now with your John Deere dealer. Write for literature on the tractor and tools in which you are interested. No obligation.

Touch-o-matic raises cutterbar of new center-mounted mower to clear obstruction. Scenes at top show new pickup-type disk harrow.

The "M" is the 1-2-plow John Deere Standard-Tread General-Purpose Tractor. Shown with Touch-o-matic controlled cultivator.

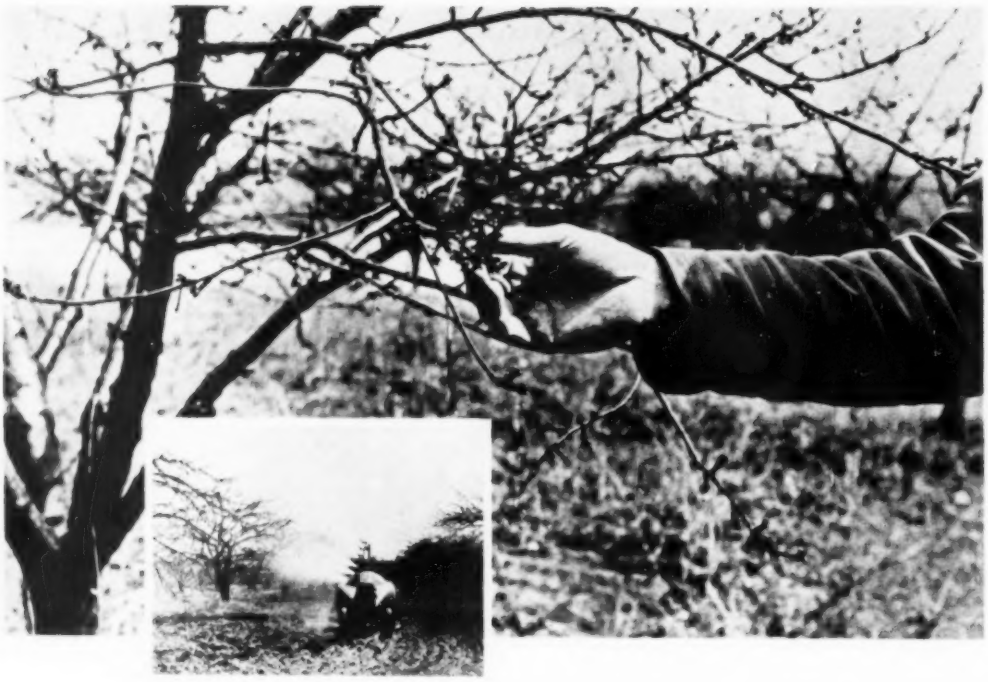


The 2-3-Plow "MC" Track-Type brings you economical power for year-around service on a wide variety of field and orchard jobs.

Front-end loader is one of many modern, hydraulically controlled tools, ready to save time, muscle, and money on your farm.

A COMPLETE SYSTEM OF FARMING FOR SMALLER FARMS . . . IDEAL HELPER ON LARGE FARMS

WRITE FOR FREE LITERATURE TO JOHN DEERE MOLINE, ILLINOIS



An early start is important!

A good fruit harvest starts long before the first leaves appear on the trees. It is never too early to start planning a good spraying program—a program to assure you of the best possible crop.

Orchardists planning their spraying programs will find in the complete Dow line the all-season protection they need. Dow's tested insecticides and fungicides are designed to work well together. Each one does its job with minimum labor and material costs. Each is uniform, dependable, tested for results.

In addition, Dow has developed, tested and marketed many other aids for the grower, including plant growth regulators, grain and soil fumigants, wood preservative and brush, weed and grass killers.

Ask your supplier for

DOW AGRICULTURAL CHEMICALS

It pays to lead off with *DN-289*, Dow's NON-OIL dormant spray material for apples, pears, cherries, plums and pecans. Easy to mix, completely water-soluble—DN-289 controls bud moth, aphis including rosy apple aphid, scale insects, cherry case bearer, pear psylla, pecan nut case bearer and Phylloxera aphid and assists in reducing red mite population.

THE DOW CHEMICAL COMPANY

Agricultural Chemical Department • Midland, Michigan

USE DEPENDABLE DOW AGRICULTURAL CHEMICAL PRODUCTS

WEED, BRUSH AND GRASS KILLERS • INSECTICIDES
FUNGICIDES • PLANT GROWTH REGULATORS
GRAIN AND SOIL FUMIGANTS • WOOD PRESERVATIVE

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

Hartman Farms agree . . .

John Bean SPEED SPRAYER

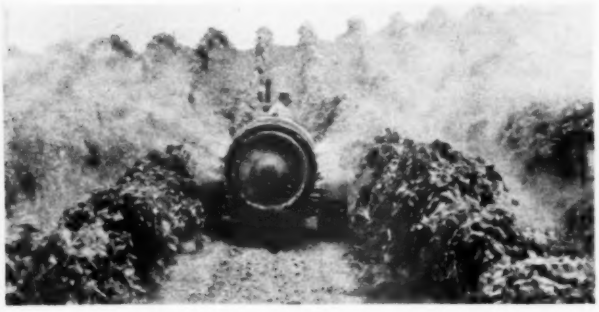
makes spraying easier, and brings a BETTER HARVEST at LESS COST

When you market a good share of your fruit through your own retail outlet, you're more than ever aware that a quality crop at lower cost means real profits. Hartman Farms, near Columbus, Ohio, do just that and they protect their 116 acres of apples, grapes and peaches with a John Bean Speed Sprayer.

"A ***Speed Sprayer*** makes our work easier because we apply material when it should be applied", says Hartman Farms Orchard Manager, Major Womeldorff. "We get clean fruit because of the better coverage made possible by our Speed Sprayer. This is true even in our peaches that are especially thick.

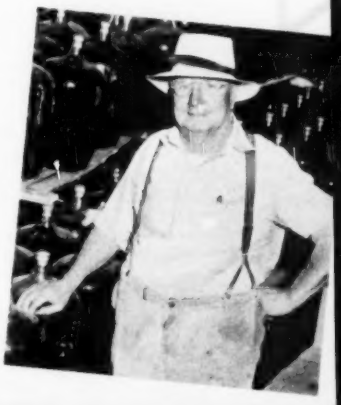
UP! Rugged contours are no problem with a well-balanced Speed Sprayer at the Hartman Farms. Just as easy, is the one-man operation by the tractor driver to save labor and still get the thorough coverage needed, plus handy controls to make the wind work for you and help conserve valuable spray material. Your 1952 Speed Sprayer will spray one or both sides, or extra high, to fit the needs of your orchard — all controls are instant in operation, and right at the driver's side.

DOWN! You know that a Speed Sprayer gets into the top-centers of tallest trees, but here's proof that it gets the undersides as well. Hartman Farms get excellent control of pests and disease in Concord Grapes by two-way spraying. They say, "An extra advantage is that when poisonous spray material is used, it is kept at a safe distance from the driver, and hard-labor hand-spraying is eliminated."



Any commercial grower can have better fruit at lower cost with the sprayer from the complete John Bean line that fits the needs of the orchard. For air-type spraying there is the 36-L Speed Sprayer, and the new 1952 model 29-L for smaller orchards. The new John Bean Speedaire attachment brings the advantages of air-type spraying to growers at a new low cost. For growers who need automatic high pressure spraying, the John Bean Low-Boy brings it to them. Whatever your spraying need, John Bean has the equipment to help you get better fruit at lower cost!

"YES!" says Major Womeldorff, Hartman Farms Orchard manager, "Now one man and the Speed Sprayer covers the area in one day that used to take up to 3 days for 3 men to cover. We spray when we need to because a Speed Sprayer sprays even into a strong wind."



Write for NEW 1952 CATALOGS to Dept. AF-2.

JOHN BEAN Dept. AF-2, Lansing 4, Michigan • San Jose, California

DIVISION OF FOOD MACHINERY AND CHEMICAL CORPORATION

California vegetable grower

Maine potato grower

Oklahoma wheat grower

Virginia strawberry grower

Arizona vegetable grower

Minnesota corn grower

NO MATTER WHAT YOU GROW....

Tennessee tobacco grower

California citrus grower

Georgia pecan grower

New Jersey bean grower

New York vegetable grower

NO MATTER WHERE YOU GROW IT....

REMEMBER— **PARATHION** KILLS MORE

TYPES OF INSECTS ON A BROADER RANGE

OF CROPS THAN ANY OTHER INSECTICIDE

Consult your local agricultural authorities on the advantages of PARATHION insecticides or write for Parathion Grower's Handbook.

Oregon pear grower

South Carolina peach grower

AMERICAN Cyanamid COMPANY

Manufacturer of Thiophos® Parathion Technical

Agricultural Chemicals Division

30 Rockefeller Plaza, New York 20, N. Y.

AVAILABLE FROM NATIONAL MANUFACTURERS

Michigan apple grower

Florida vegetable grower

Virginia apple grower

Texas vegetable grower

Washington cherry grower

Mississippi cotton grower

Florida citrus grower

Dakota sugar beet grower

Pennsylvania grape grower

LETTERS TO THE EDITOR

Our Youngest Reader

Dear Sir:

I am sending you this picture of my six-month old son reading your AMERICAN

FRUIT GROWER. As you can see, we believe in exposing him to the facts early in life. We thoroughly enjoy every issue, as you can see. Keep up the fine work!

Lexington, Ohio — Rollin Cockley

Poor Results With Fish Oil

Dear Editor.

As a subscriber to your magazine for the past several years, I have read the articles with much interest, especially ones that refer to dwarf fruit trees.

I am a member of the New York State Fruit Testing Co-op and have secured Malling VII rootstocks from the station. These were budded a year ago last summer to Melba, Macoun, Delicious, Red, Spy, and others with good results.

Unfortunately, on a friend's advice, I painted undiluted fish oil on the young whips last winter to keep the rabbits away, and thus killed all the whips but not the rootstocks which I am going to graft in the spring, as they were too small for budding last summer.

To avoid rabbit damage in the future, I am going back to chicken netting for each tree.

Rochester, N.Y. — Kenneth W. Britton

Spray Injury

Dear Editor:

Do you have a compatibility chart concerning plants and their susceptibility to injury from various insecticides and fungicides which is similar to your compatibility chart on fungicides and insecticides? I have found the latter most useful. Occasionally we find some of our ornamentals and florists crops injured by sprays; such as the effect of DDT on cucurbits; parathion aerosols' injury on Boston fern, Crassulas, jade plants; and other incompatibilities.

Corvallis, Ore. — Victor Nielsen

The susceptibility of fruit trees to spray injury depends greatly on the weather as well as the kind of insecticide or fungicide. For instance, sulfurs may cause injury if applied when temperatures are high whereas copper compounds may injure fruit and foliage when temperatures are in the 40° to 65° range. As reader Nielsen points out there are also various incompatibilities not affected by weather—for instance, parathion on McIntosh and chlordane on European-type plums. This information is graphically illustrated on our Weather Factors Chart for pome and stone fruits which may be obtained by sending 25 cents to cover cost of mailing.—Ed.

Indian Brush Burning

Dear Sir:

At present few folks realize that the amount and kind of vegetation on a watershed is important in determining stream and spring flow.

I am making a study of the old-time Indian practice of burning undergrowth and brush to increase water flow and would like to know:

1) What Indian tribes burned the undergrowth for any reason at all.

2) In what part of the country did they burn brush and at what time of the year.

3) What benefits did they expect.

I would certainly like to hear from anybody who can throw some light on the above questions.

Route 1, Box 409
Niles, Calif. — Bill Gianella

There is considerable evidence that removal of brush will induce dry springs to start flowing and will result in increased flow from live springs. In these times when water table levels are decreasing alarmingly, Reader Gianella brings up some significant questions.—Ed.

Why I Like Farming

Dear Editor:

I like farming first of all because it is the oldest of occupations. "When tillage begins, other arts follow." Farmers, therefore, are the founders of civilization.

It is natural for me to like farming as my grandfather and father are farmers. I, myself, am in my last year of high school and hope to go to an agricultural college.

I find that life on the farm is not an easy one and is busy. Each season on the farm brings new tasks. Spring brings plowing, harrowing, and planting; summer brings on cultivating, spraying, and haying. In fall comes harvesting of different crops, cutting corn, and gathering apples. Winter to some would seem a holiday with nothing but chores, but let them crawl out when it is 10° below zero to go to the barn.

Since I was born, modern machinery, tractors, riding cultivators, electricity in the home and barns, pumping water anywhere that it is needed, tool sharpening and many other things have made farm work a great deal easier.

The radio and television with their market and weather reports, news, etc., bring much pleasure and help to the farmer. The car and good roads soon bring us to a nearby city, and our farm products are trucked into the market daily. Schools, churches, and libraries are within reach of all. All in all, I feel I am a part of the farm life and am glad that our family live and work together.

Hammonton, N. J. — James Shoemaker, Jr.

Save Up To 20%
On Materials...
50% On Labor... With An

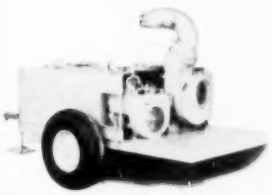
AERO-MIST

ORCHARD SPRAYER

Lawrence Aero-Mist Sprayers provide the economy and control found only in the modern concentrate method of spraying. Atomized mist propelled by high velocity air insures complete coverage of *all* leaf and fruit surfaces.

Only Lawrence Aero-Mist concentrate sprayers can point to over four years of operation in commercial orchards. Choice of two models provides a mist sprayer tailored to fit the size of your orchards and the labor force available.

"Mist-O-Matic" A sturdy, completely automatic mist sprayer designed for operation by one man—the tractor driver. Spray applied through exclusive three-nozzle revolving head. Ideal for large scale spraying, or where manpower is at a premium.



"Mist-O-Mite" A compact, manually operated mist sprayer for small and medium-sized orchards where a two-man crew is available. Sprayer operator easily aims flexible air dispenser at any angle.

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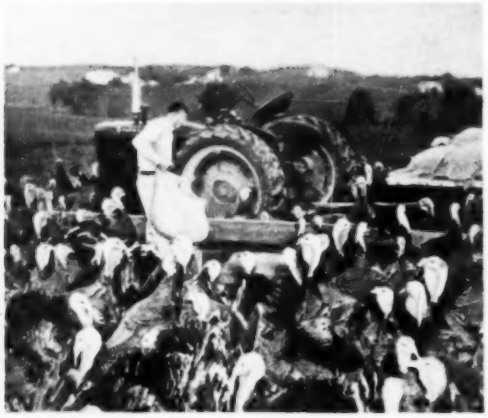

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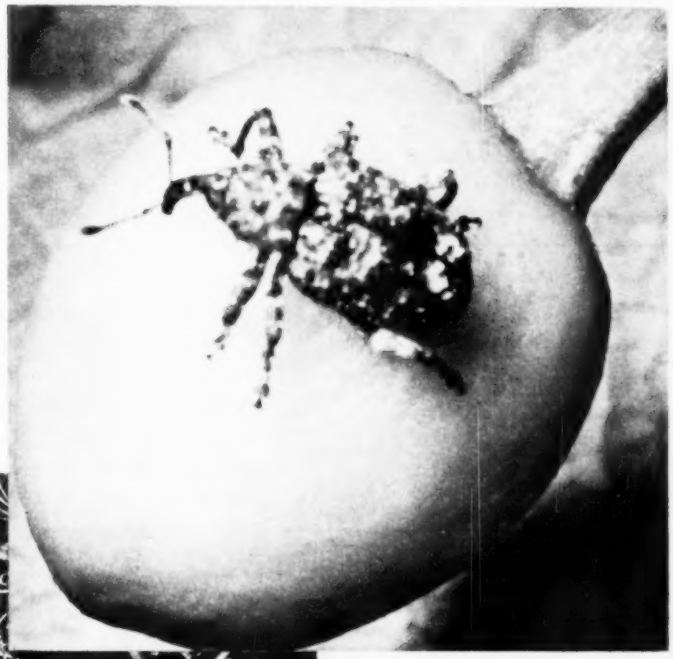
PROGRESS IN INSECT CONTROL

By B. A. PORTER
U. S. Department of Agriculture

"THE Organic Era" was the title given to an article on orchard insecticides that appeared two years ago in AMERICAN FRUIT GROWER. This title (which has no relation to organic farming) still applies. Nearly all insecticides that are in the process of development are organic in nature. Many of the older insecticides—lead arsenate, Paris green, cryolite, and lime sulfur—are referred to by the chemists as "inorganic." In fruit insect control, the organic insecticides have just about taken over.

Solid progress is being made in the development of the new insecticides, although little of a spectacular nature has taken place within the year. Additional information is being accumulated on the recently developed insecticides, and a limited number of new ones are coming into commercial use on an experimental basis.



Plum curculio on cherry (enlarged).

The fall webworm feeds on leaves without leaving its test or web.

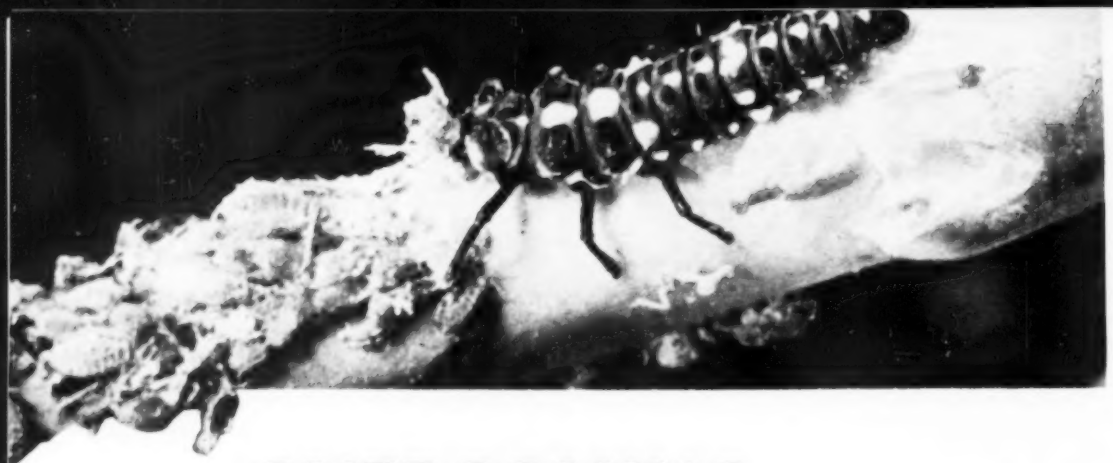
It is hard to generalize in a discussion of the newer insecticides. Most of them are highly specific. That is, they may be extremely effective against one insect or mite, but comparatively ineffective against closely similar kinds. In one climate a material may give outstanding control and in another may fall down badly. A chemical may do no harm to leaves, wood, or fruit of certain varieties under one set of conditions, yet cause serious damage under other conditions, or to other varieties of the same fruit. Growers can of course secure detailed information on the new materials, applicable to their locality, from the state agricultural experiment stations or extension service.

The use of parathion in the control of orchard insects is still increasing, in spite of the hazards involved in its use. Although these hazards are serious, the percentage of orchard workers who have actually suffered serious ill effects has been comparatively small. Apparently there are many situations where simple precautions are enough to prevent injury to workers. However, parathion should always be looked on as a loaded gun, and never handled carelessly.

Although effective against many species of mites, parathion is not the universal miticide that we have been looking for. The citrus rust mite and red mite are not much affected by parathion. During the last two years several strains of mites have been found that are resistant to this material. Resistance was first noticed in certain greenhouse mites. Those in most greenhouses were readily con-

(*Continued on page 42*)

The enlarged photographs of insects appearing in the editorial pages of this issue are the work of A. L. Jenkins, assistant professor of entomology at the University of Missouri, Columbia, who makes a specialty of "shooting" insects.



OVERCOMING FRUIT DISEASES

By JOHN C. DUNEGAN
U. S. Department of Agriculture

THE recent technological advances in the art of spraying provides the fruit grower with such a variety of materials, machines, and methods that a survey of these current procedures may assist the grower in formulating his plans for fruit disease control in 1952. Irrespective of the materials, machines, or methods used by the grower, every effort should be made to eliminate the primary infections at the beginning of the season. The control of these primary infections will make the task of disease control much simpler for the balance of the season.

Materials

Lime Sulfur—A discussion of spray materials logically starts with lime sulfur, which has been used for many years for the control of a variety of fruit diseases. Its toxicity to fungus spores, low cost, and general availability are points in its favor. However, there is a wealth of experimental data proving that these advantages are greatly overshadowed by the injury it causes. Therefore, its use on apples should be confined to the prepink and, possibly under conditions of severe scab infections, to the pink spray applications. It should not be used on the red sports of the Delicious variety.

Elemental Sulfur—Various forms of sulfur pastes and wettable sulfur powders are used as substitutes for lime sulfur in control of apple diseases. They are less toxic to the scab fungus than lime sulfur but do not produce so much injury to apple. Their use during periods of high temperature may cause serious injury.

Various forms of elemental sulfur are still the standard materials for the control of brown rot and scab of peach in the East. Sulfur cannot be used in the Far West on apricots without causing serious injury.

Bordeaux Mixture—Bordeaux mixture is another powerful fungicide that is slowly being replaced because it frequently produces severe injury to the leaves and fruit. It is still the standard material for the control of coryneum blight of peaches in the Far West, and a weak mixture (½-½-100) is used for the control of pear blight.

Ferbam (ferric dimethyl dithiocarbamate)—One of the first organic fungicides to be widely used, ferbam has proved to be an excellent substitute for lime sulfur and Bordeaux mixture for the control of apple scab, blotch, and bitter rot. It rarely, if ever, produces injury but may leave an objectionable dark residue on light-colored fruit. This material is particularly toxic to cedar rust spores and its introduction has made possible the control of cedar rust by spraying. Ferbam gives excellent control of pear scab in the Far West without injury to the finish of the fruit and is used successfully in the East for control of pear leaf spot.

Phygon (2,3-dichloro-1,4-naphthoquinone)—Phygon is another organic material used to replace lime sulfur and Bordeaux mixture. At times it may produce spotting of fruit and chlorosis of leaves, but these effects are generally not important if the material is used only in the prepink, pink, and calyx spray applications for control of apple scab. Phygon has proved to be exceptionally efficient in the control of serious outbreaks of apple bitter rot where a mild spotting of the fruit can be tolerated for one or two seasons until the disease can be brought under control.

Above photograph shows lady beetle larva feeding on aphids (greatly enlarged).

Phenyl Mercury Compounds (Puratized Agricultural Spray, Tag, Dyanicide, Aventa)—Certain complex organic mercury compounds are extremely effective for the eradication of the apple scab fungus. Their greatest weakness is that they have little or no residual or protective value. It is best to use them following a thorough spraying of the overwintered leaves on the orchard floor with dinitro compounds (Elgetol or Krenite) to kill the bulk of the overwintering spores (ascospores) of the scab fungus. Certain experiments in 1951 indicate that these mercury compounds will eradicate scab infections if the sprays are applied immediately after infection periods.

Mixtures of ferbam and organic mercury compounds have been used successfully, but there is need for further investigation of such combinations. Organic mercury sprays are poisonous and should not be used later than the calyx application, to avoid the possible accumulation of mercury residues on the fruit. The practice of using mercury sprays later in the season as emergency measures is dangerous, especially if

(*Continued on page* 44)

TIPS ON TIMING INSECT SPRAYS

By PHILIP GARMAN
Connecticut Agricultural Experiment Station

FAILURE to control insect pests or diseases may be due to poor materials, poor spraying, or poor timing. One of these conditions may mean a considerable loss in marketable fruit; two of them usually is serious; and if all three prevail the results are frequently disastrous. Good materials and good spraying, however, may be wasted unless applications are made at the proper time. Made at the right period they save money in prevention of pest build-up requiring more sprays and more labor than are actually needed.

Many factors influence the development of insects and hence actual spray operation from year to year. Of these perhaps the dominating one is temperature. Also important are rainfall, humidity, and sunlight. Every grower realizes the effect of humidity and rainfall on diseases, but not many realize the stimulating effect of continual rain and dampness, coupled with cool temperatures, on aphid development, or the effect produced by dry, sunny weather on mites.

Changes in spray materials often necessitate changes in timing. Substitution of an insecticide that disappears rapidly means more frequent application; or the use of one that kills a different stage or the same stage more effectively spells change in the spray program. Chemicals that eliminate natural predators or parasites may necessitate more rather than fewer sprays.

Then, of course, the insect or disease, the stage affected, and the intensity of the infestation are important. Intense infestations in one area may not be controlled by chemicals (even if correctly timed) that easily handle them in another.

Lastly, the size of the orchard may directly influence spray operations, and timing cannot always be as accurate in the larger orchard as in the smaller. Modern machinery is doing much to remove some of the failures due to poor timing.

In dealing with the various orchard insects it is well to consider: 1) the injurious stages and usual period of activity; 2) how and where to look for signs of injury or evidence of presence; 3) what factors to consider before getting out the spray rig. A general survey of all sprays recommended for Connecticut indicates that the most important periods are from calyx through the first cover, and, only slightly less important, from the second cover through the second maggot (last of July).

Insects injurious to the apple include the following:

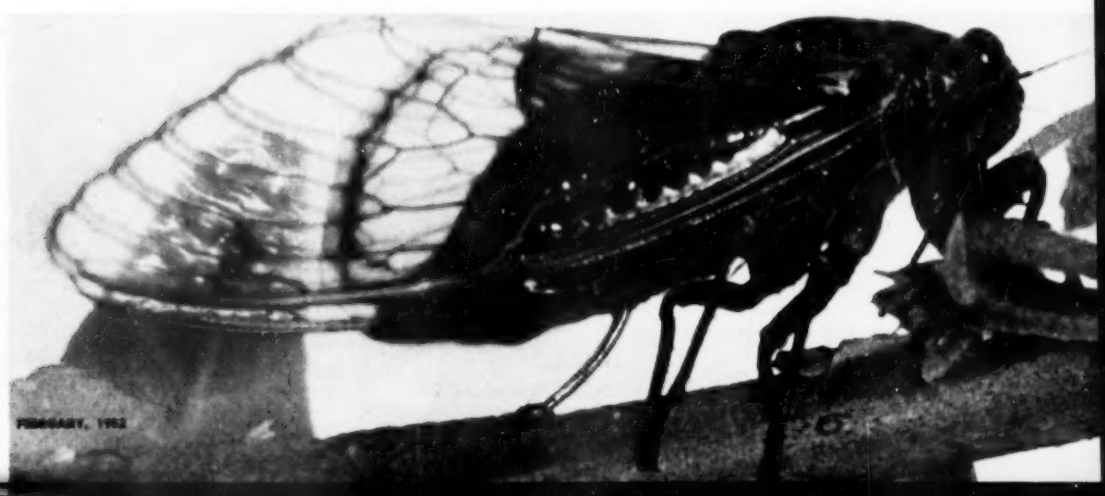
Aphids—Both green and rosy aphis are sometimes destructive. Black shiny eggs of both overwinter on twigs. Sprays may be applied for them in late March or early April. The greatest damage from the rosy species occurs during May and early June, but the green aphis may continue until July and frequently starts up again in September.

You can tell whether the year is an "aphis" year generally by observing aphis on other plants in garden and orchard. If they are abundant on all sorts of plants, watch out. If there are few and predators such as lady beetles are abundant, breathe a little easier. Also, two bad aphis years rarely follow one another in succession.

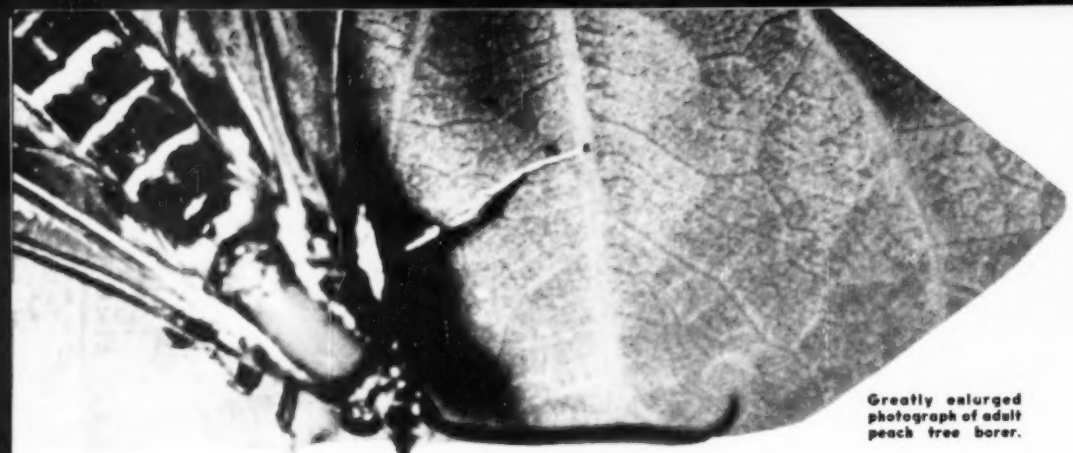
Green aphis should be watched for on watersprouts and rapidly growing terminals. If the weather is rainy, damp, and cool, they may go onto the leaves and fruit, but frequently they decline just before they become numerous enough to get on the fruit or do serious damage to the leaves.

Bud Moth—Activity occurs during May and early June, but a second generation starts in mid-July. Wintering larvae in cocoons may be found on the twigs in spring if one has good eyesight, but it is easier to find them by watching for their

(*Continued on page* 46)



Greatly enlarged photograph of cicada (locust) laying eggs in apple twig.



Greatly enlarged photograph of adult peach tree borer.

ANOTHER SEASON'S EXPERIENCE WITH CONCENTRATE SPRAYING

By A. B. BURRELL, *Cornell University*

DURING 1951 a large amount of experience was had with concentrate spraying. In the main the grower-experience that has come to the writer's attention has been favorable. However, some of the investigators' reports have been conflicting and confusing, and growers have had difficulty on some points.

All spraying in which twice or more than the usual amount of spray material is used per 100 gallons will be considered in this article. It has become fairly general in the Northeast to use the term "semi-concentrate" for sprays up to and including 4X, and "concentrate" for sprays of 6X, 8X, or 10X.

There is such a diversity of machinery that the details for operational efficiency are different for each machine, and each manufacturer can provide instructions for his own sprayer. The one feature common to all is an air-blast which helps to break up the spray into fine droplets and to carry the mist into the tree.

Effectiveness is determined by having the right type of deposit at the right place at the right time. Operational efficiency depends on having a dependable sprayer of adequate power and discharge capacity, together with a rapid means of filling and a short trip from the filling station to the orchard. In my observation managerial ability of the fruit grower becomes an increasingly large factor as mechanization increases and as labor becomes more costly.

Does concentrate spraying actually reduce the cost of spraying? A New York survey in 1950 showed that on the average the saving was comparatively small, and the rate of spraying averaged faster for growers using dilute air-blast equipment, mainly Speed sprayers, with a few rigs like Friend Airblast, Hardie Air-King, and Myers Silveraire. The reason the dilute air-blast group got faster coverage was because most of the growers had larger and more powerful outfits.

A comparison devoid of the complication of a diversity of machinery types is available in records at Burrell Orchards, a 108-acre operation consisting mainly of McIntosh trees planted from 1930 to 1933. A Speed sprayer has been used since 1947. Variations in the seasons create irregularities that will be explained later, but the trend of the results is unmistakable.

Table 1. The influence of concentration on efficiency of spraying. Burrell Orchards, Peru, N.Y. Figures are per acre per year.

Year	Prevailing Concentration	Gallons of Water	Sprayer Hours	Truck-Mounted Refiller Hours	Man Hours
1947	1X	4907	4.7	4.6	12.3
1948	2X	2815	3.3	3.3	7.6
1949	4X	1676	3.1	2.3	5.9
1950	4-6X	1685	4.0	1.5	6.3
1951	3-6X	1333	3.5	0.4	4.5

The figures for 1947 are abnormally high because of an exceptionally rainy year. On the other hand, previous to 1947, with dilute spraying,

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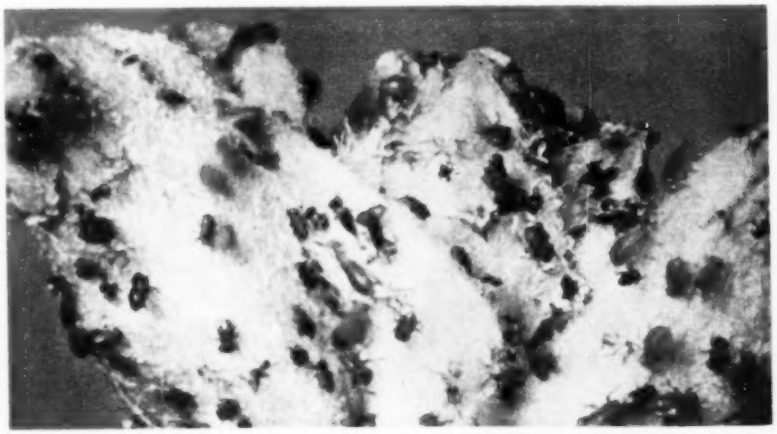
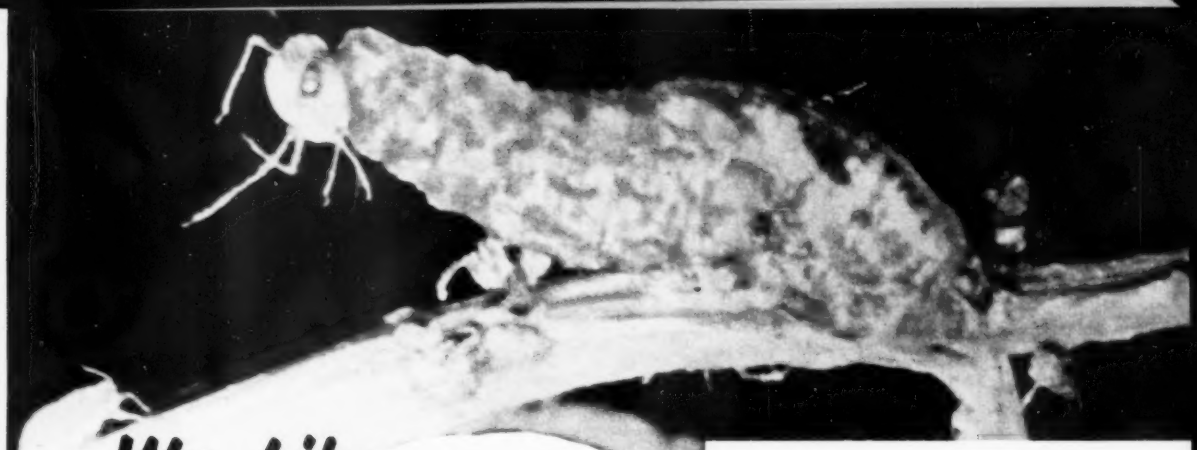


Right—Aphids on apple bud (enlarged).



We Like CONCENTRATE SPRAYING

By DAVID L. WHITE

THE subject of concentrate spraying is most controversial. We submit our experiences for the past three years in the hope that other growers may find something of value in them, always bearing in mind that each grower must adapt his operations to fit his particular conditions.

Readers will be interested in our background, the better to evaluate our results. We have some 100 acres of peaches near Hartsville, S.C., about evenly divided into five varieties which ripen in succession from early June to August 1.

Prior to 1949 we had a heavy infection of bacterial spot on one variety, minor on another. Brown rot was a problem, major on one variety, minor on the balance. Because of summer cover crops we had tarnished plant bug injury. Oriental fruit moth had been a problem for years. Curculio, always present, was kept under control by bumping, picking up drops, and spraying. We always had a scale problem, though we used a dormant spray each winter. In brief, we were continually following recommended practices but were usually in trouble.

In 1949 we used concentrate spraying almost exclusively, using a John Bean No. 7 mist sprayer. Certain difficulties were encountered, chief of which was frequent clogging of lines and nozzles. We finally adopted the use of five 5/64 jet-type nozzles, eliminated all small screens, increased the pressure from 60 to 100 pounds, depending on amount of solids used, and eliminated much of our trouble.

We use the following formulas per 115-gallon tank.

Among the several groups of predaceous insects or insects which feed upon other insects are the syrphid flies, the larval form of which feeds on aphids, as shown in the above greatly enlarged photograph.

No. 1—
6 lbs. 15% wettable parathion
24 lbs. fine wettable sulfur
10 lbs. neutral zinc (trade name Nu Z)

No. 2—
24 lbs. sulfur
32 lbs. lime
16 lbs. 36% metallic zinc

Our program for Elbertas was five applications of the No. 1 formula as follows: petal fall, shuck-off, two weeks later, five and three weeks prior to harvest. The No. 2 is applied to certain varieties, according to weather conditions, for brown rot and bacterial spot control. The program varied somewhat on the earlier varieties.

We called the above formulas a 4X concentrate because we used about four times the normal amount of solids and tried to actually apply one-fourth the normal gallonage per tree.

As to results, we estimate that for the past three years we have saved more than $1,000 per year on labor. Our savings in equipment are substantial. Our savings on materials have been most substantial, though they are difficult to enumerate in dollars and cents.

Most important is the excellent control we have had of insects and diseases.

In 1949 there was a marked reduction in brown rot, bacterial spot, Oriental fruit moth, tarnished plant bug, and scale. In fact, in our packing house we had no material count on any of the above except for a minor count of bacterial spot on Goldeneast. Some brown rot showed up in one variety but it was not nearly so bad as in previous years. During pruning we found only 28 trees with scale (San Jose). These trees were spot-sprayed with lime sulfur, the usual dormant spray being omitted.

In 1950, because of most unusual weather conditions, parathion was not applied at petal fall. At shuck split we made a heavy application of BHC with a conventional sprayer, then followed our 1949 program for the balance of the season. At harvesttime we had the cleanest crop in many, many years—no brown rot, no bacterial spot, no worms, and only 10 or 12 trees showing scale (San Jose). We again spot sprayed with lime sulfur, leaving off the usual dormant.

In 1951 we followed the same program as used in 1949 and 1950. We had an excellent crop which was almost perfectly clean. We did have fairly severe blossom blight infection in one variety. Several quick applications of dilute lime sulfur and wettable sulfur, just prior to harvest, cleaned up the brown rot. We had no trouble with brown rot at the packing house.

In late December of 1951 casual inspection revealed no scale.

It may be well to emphasize the results obtained over the three-year period. Excellent control of all insects common to our section was obtained, also most satisfactory control of bacterial and fungus diseases.

(*Continued on page* 53)

CONTROLLING ORCHARD MITES

By E. J. NEWCOMER, U. S. Department of Agriculture

ORCHARD MITES have become the No. 1 pest control problem for the fruit grower in many areas, particularly in the West. Formerly, control was incidental to that of the codling moth and other pests. Now, a spraying or dusting program is often based primarily on mite control.

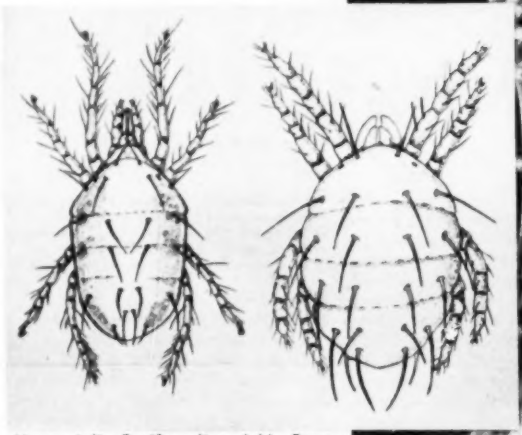
In the East, orchard mites are pretty much limited to two species. One of these, the European red mite, winters in the egg stage, and the bright red, spherical eggs, when numerous, are often conspicuous on the twigs and branches of deciduous fruit trees. The adult mites are velvety or brownish red, with whitish, curved spines on the back. The other species is the two-spotted mite, which winters as an orange-colored adult in leaves or trash, or under loose bark on the trees. The summer forms are greenish or yellowish, with two dark spots on the middle of the body. These mites spin a great deal of webbing in which the colorless eggs are laid.

In the West, the two-spotted mite is often replaced on fruit trees by the Pacific mite, a species with almost identical habits and very similar appearance. Adults can be distinguished by the dark area on the body, which usually extends to the rear end on each side and may even cause almost the entire body to appear black.

Another species, the clover mite, has long been a pest of almonds in California, often being called the almond mite on that account. Of recent years it has become of prime importance on most of the deciduous fruits of the Pacific Northwest. It is distinguishable by its larger size, long legs, dull reddish or greenish color, and its flattened appearance. It winters chiefly in the egg stage, but also to some extent in the adult stage. The eggs are somewhat larger than those of the European mite, and hatch in the spring about a week earlier.

In the West; also, there is a small, greenish, and somewhat insidious mite which feeds chiefly on apple, limiting its activity to the undersides of the leaves. On this account it may cause serious injury before its presence is suspected, as the upper surfaces of the leaves remain normal in appearance. This mite winters as a lemon-yellow adult in much the same locations as the two-spotted mite.

Specialists tell us that actually there are two closely related species.

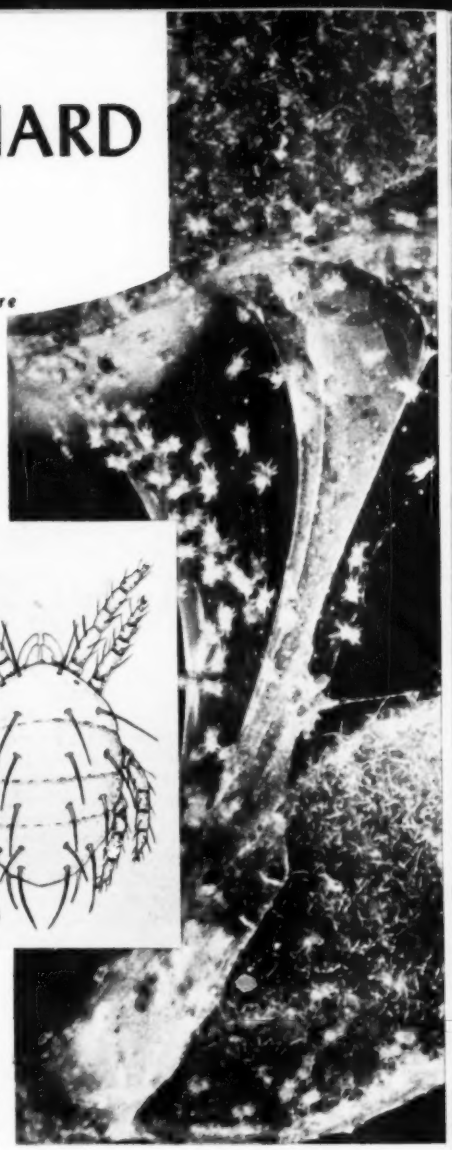


Above, left—Pacific mite; right—European red mite (greatly enlarged).

One, the Willamette mite, has been especially noticeable in California, although it has been found in the Northwest on oaks and various wild shrubs. The other, the yellow mite, has been injurious to apple and pear in the Hood River Valley of Oregon and in some orchard areas of Washington. The grower has no need to distinguish between these two species, as their habits seem to be the same.

The European red mite is also an important fruit pest in the West, and there are several other species of minor importance.

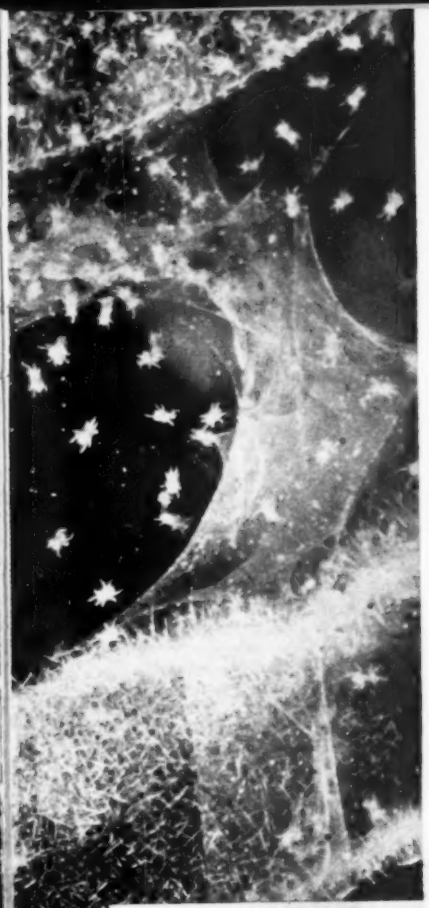
It used to be a moot question whether to control mites with oil or sulfur. Each had advantages and disadvantages. Certain dinitro compounds were also used effectively. DDT changed all that and there was a period of uncertainty and tension during which the grower didn't know whether he was going to control the mites, and often did not. Then came parathion, with its almost miraculous toxicity to mites, and the grower sat back and relaxed. He



Two-spotted mite spins webbing in which it lays colorless eggs (enlarged).

knew he could control the mites. Or, could he?

First from Wenatchee, Wash., and then from other areas came reports of failure. Even at two pounds to 100 gallons, parathion was failing. Entomologists were skeptical but they went to work on the problem and soon found that it was indeed true. Mites in some orchards were no longer being controlled with parathion. They had become resistant to it. They were not different species, but simply different strains which could not be distinguished by eye from those that were not resistant. So the search was on for



Clover mite, also known as almond mite, is pest in Pacific Northwest (enlarged).

acaricides, or mite killers, that would control these tough strains.

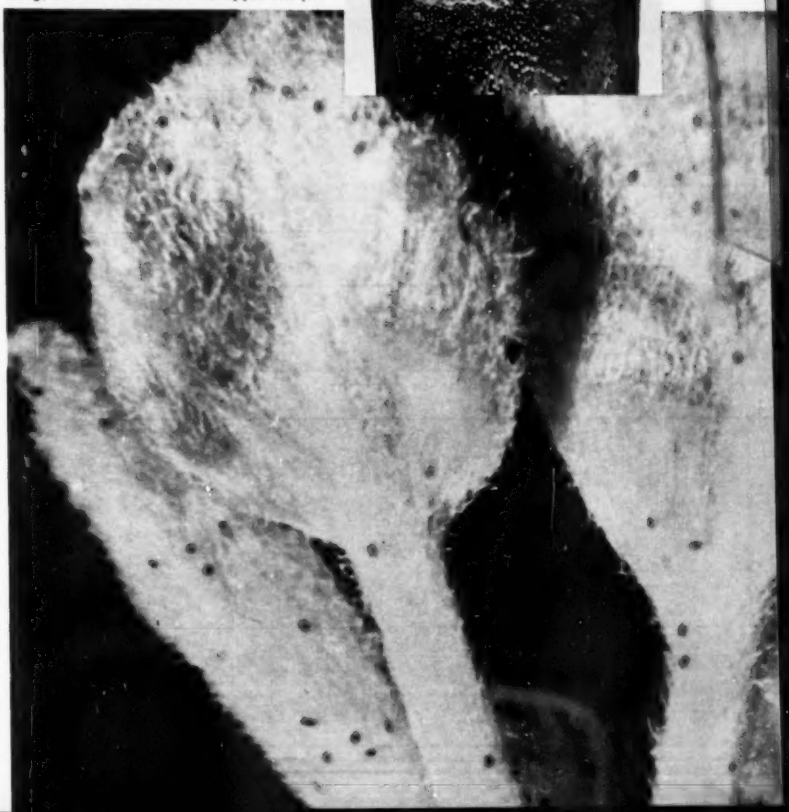
Fortunately, manufacturers of insecticides had been developing other compounds for use against mites. One reason for this is that parathion, as is well known, is rather dangerous to handle. And although growers in the Northwest have used over a million pounds of it without a fatality, it has killed several persons elsewhere who were too careless with it. Parathion is an organic phosphate, and some phosphates are much more toxic than others. Some of the new compounds developed are phosphates which are less dangerous to handle than parathion. Others do not contain any phosphorus, and they are also less dangerous.

One drawback to many of the nonphosphates is that they are rather specific in their action. They may be extremely effective against mites but relatively ineffective against other pests. And yet the fruit grower wants to be able to control such pests as aphids, pear psylla, scale, and leaf rollers with the same applications he is using for mites.

We now have eight or 10 acaricides to choose from. Some of these compounds may control one species of mite better than another, or they may control resistant mites while others do not, and some of them may injure certain varieties of fruit. But any one of them can be relied on to do a good job of controlling mites if used right. The grower must learn the peculiarities of these compounds, and make his decision on a control program accordingly. This may seem complicated, but it should not be looked upon as a disadvantage. Rather, it is an advantage to be able to turn to something else when the mites in the orchard become resistant to the material that has been relied on, or when, through some turn in world events, that material becomes unavailable. It should not be forgotten that resistant mites may still be controlled with oil, particularly when used on dormant trees against winter eggs.

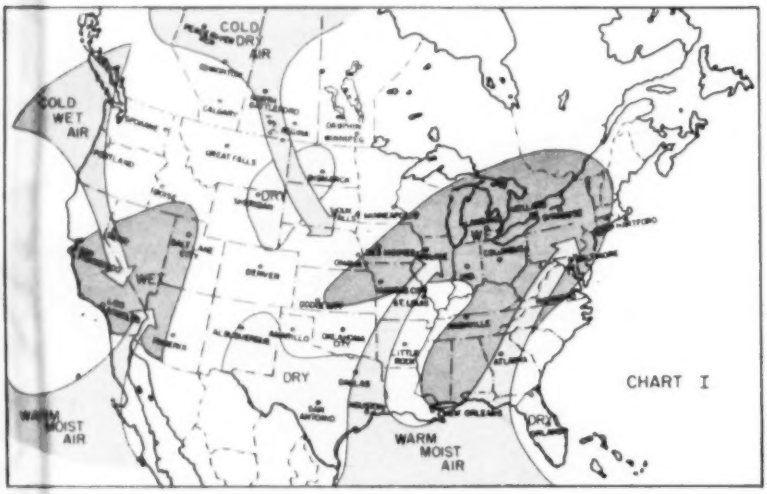
Intensive research on the new compounds is going on in the laboratories of the insecticide manufacturers, in the state experiment stations, and in the USDA. This work is providing reliable data on their relative value. The grower may obtain information about them that is applicable to his local conditions from his county or state agricultural extension service.

Right—European red mite eggs on apple twig; below—red mites on apple leaves.

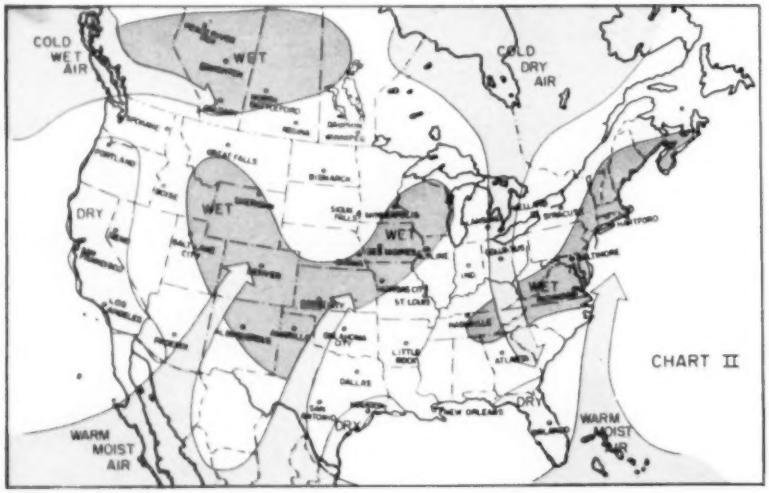


SPRING FROST FORECAST

MARCH 15 TO APRIL 5, 1952



APRIL 5 TO APRIL 30, 1952



WINTER of 1950-51 and spring of 1951 were extremely variable with regard to temperatures. November and December had unusually cold weather in much of the easterly half of the country while January and February were mild on the average in all sections. One exception was the strong cold outbreak of late January and early February in the Midwest and South Central states. The spring months, March and April, had colder than normal weather in the western half of the country, which proved very detrimental to the fruit crop.

Winter of 1951-52 has produced several important cold air flows moving from the far north and spreading throughout the United States. The cold weather of the first days in November was extreme for so early in the season. The cold flows of December also were strong and well developed but during the month a decided shift to the west began so that by January the western half of the United States was receiving the most important cold air outbreaks with these cold conditions warmed considerably before entering the eastern half of the country.

Late winter and spring up until approximately April 5 should see this tendency for cold weather in the West and relatively warm conditions in the East continuing. Chart I gives the temperature and moisture conditions expected as the last of this dominant winter situation occurs. The weather between April 5 and 30 should be strikingly different and is described by Chart II. Unfortunately for the northern sections of the West, early May is likely to revert to the winter pattern, cold in the West and warm in the East.

Chart III, giving the expected southern limit of frost, has been designed to show both the frost limits of an average year (dashed line) and

By IRVING P. KRICK

Meteorological Consultant

the southern frost limit expected this year (solid line). The dotted areas indicate zones where the last frost will be later than usual and the slant line shaded areas where it should occur earlier than usual.

The anticipated moisture supply during spring seems generally favorable. Rainfall indicated for March in California should be very beneficial and the wet zone shown for the Rocky Mountain states during April also should prove valuable. The least favorable rainfall situation is expected among the Gulf Coast states.

For the country as a whole, this year's fruit prospects do not appear as favorable as in 1951.

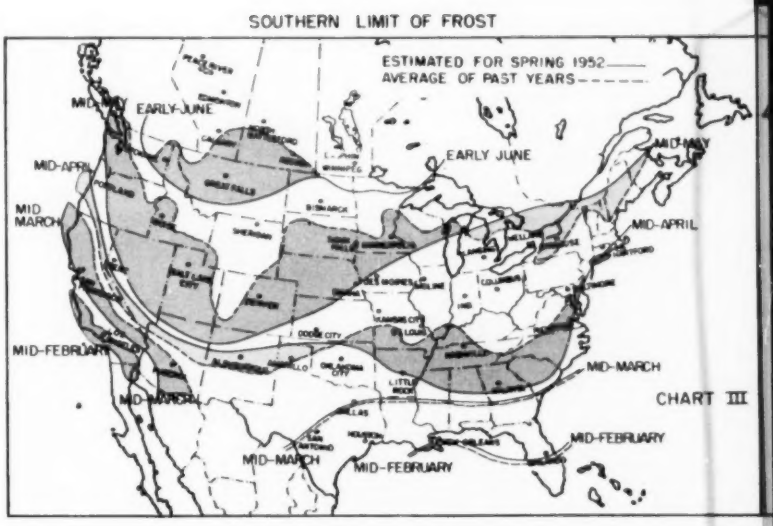
Conditions in the Northeast and in Texas and Florida appear favorable for development of the fruit crop as far as frost is concerned. However, in Texas and Florida dry weather may prove detrimental.

Chart IV shows those regions where frost is expected to injure fruit this year. There are three designated regions, one in the southeastern peach belt, another in the southwest citrus area, and the third located in the northwest.

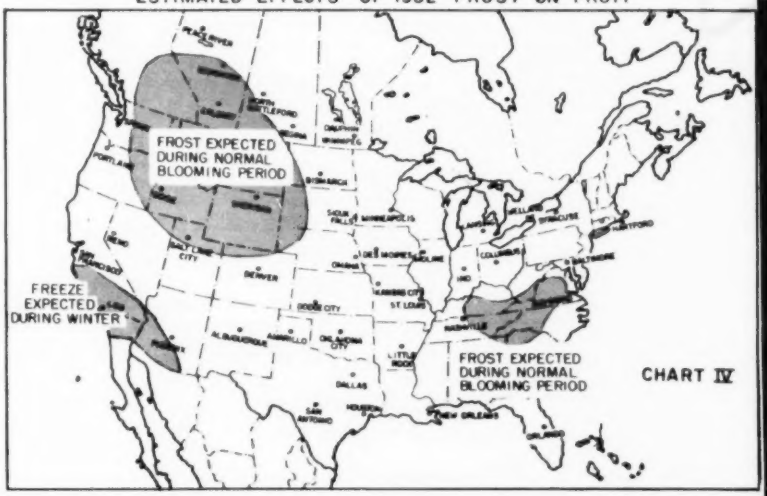
Last year southern California and the south Appalachian fruit areas went through winter and spring with very little frost damage, but this year they will find themselves less favored by nature. Winter freezes in southern California and Arizona will be detrimental to citrus and tender deciduous fruits. Cold weather during the early dormant stages of the peach crop in the Southeast followed by mild temperatures in the winter should make the trees susceptible to the spring frost predicted for this year.

Detrimental frosts also are forecast for portions of the Northwest, but injury generally will not be as severe as that caused by the spring frosts of 1951.

SOUTHERN LIMIT OF FROST



ESTIMATED EFFECTS OF 1952 FROST ON FRUIT


FROST EXPECTED DURING NORMAL BLOOMING PERIOD
FREEZE EXPECTED DURING WINTER
FROST EXPECTED DURING NORMAL BLOOMING PERIOD
CHART IV

THE FRUIT AREAS OF AMERICA

LOWER RIO GRANDE

By W. H. FRIEND

FRUIT GROWING in South Texas means citrus orcharding as there is no other fruit crop that is produced in commercial quantities in this area except a few hundred acres of strawberries. Temperate zone fruits, having definite cold requirements, do not thrive in the near tropics; and subtropicals sometimes suffer severe injury when unusual freezes occur in this semi-tropical area.

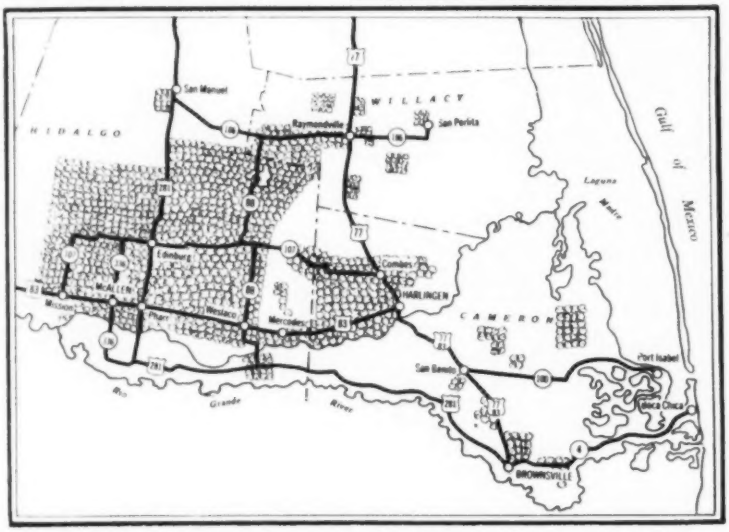
Interest in orange production in South Texas started more than 50 years ago—Beeville being the center of activity at that time. However, some oranges were planted on the Raymond ranch near Raymondville in 1906. The Beeville area is 200 miles north of the extensive plantings in the Lower Rio Grande Valley.

The enthusiasm generated as a result of the success obtained with oranges and mandarins in Bee County was the motivating force behind the development of citrus orcharding in the Lower Rio Grande Valley. Several horticulturists, including Professor A. T. Potts, and the pioneer developer, John Shary, were first impressed with the possibilities in citrus orcharding in Bee County.* Professor Potts was then superintendent of the A. & M. College substation at Beeville and later became professor of horticulture and chief of the division of horticulture at the A. & M. College Experiment Station.

Many of Professor Potts' students and finally Professor Potts himself cast their lot with the Valley and its developing citrus industry. The John Shary orchards, now managed by a son-in-law, Governor Allen Shivers, were started about 1908. Mr. Shary was the first individual to own as much as 500 acres of Valley citrus orchards.

Other persons who were active in the development of citrus orcharding in the Valley in the early days were: Charles Voltz, Mission; Harry Banker, Brownsville; J. A. Hickman, Rio Hondo; Eltweed Pomeroy, Donna; Banks Miller, San Juan; and Raymond Mills, Weslaco.

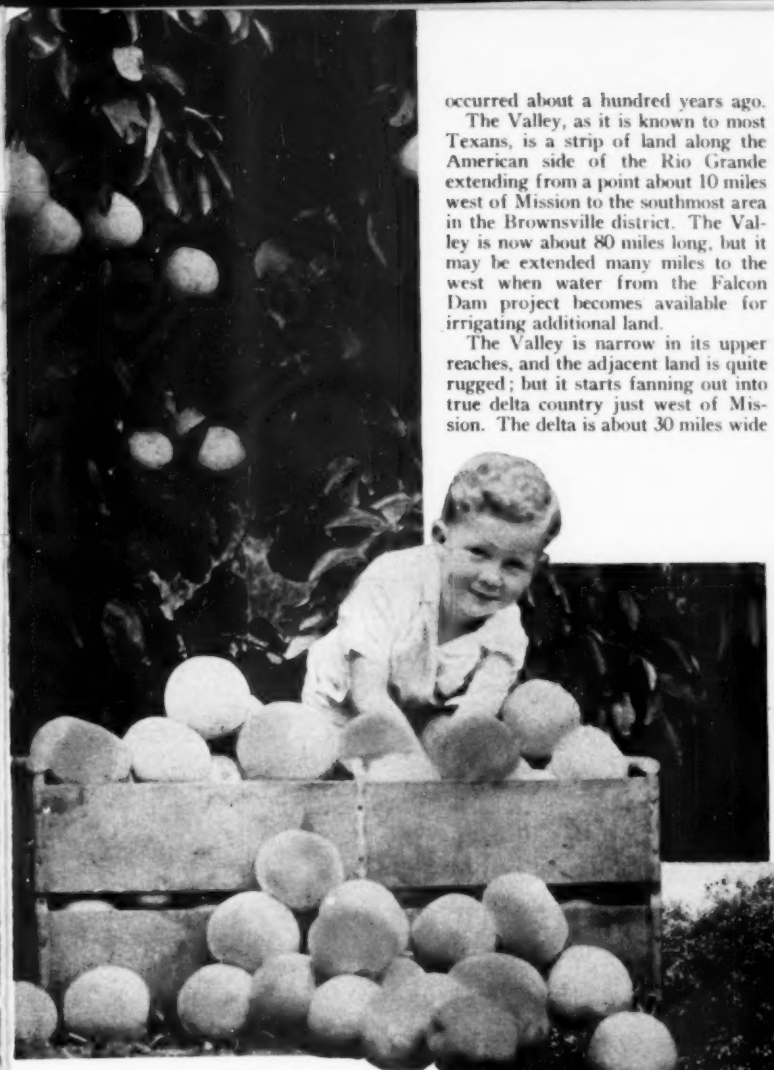
The important fruit areas covered in the five preceding articles in this series were New Jersey; East of the Cascades in Washington; California's Central Valley; the Ozark region of Missouri, Arkansas, and Oklahoma; and New England.—*Ed.*



The Rio Grande Valley is served by a network of hardsurfaced roads (top photo), railroads, airports, seaports, and barge canals. Map shows principal orchard areas.

Citrus trees grown from seed from oranges distributed at Yuletide by traveling padres who visited the ranch homes along the Lower Rio Grande

*W. H. Friend, an "oldtimer" so far as the Texas citrus industry is concerned, is Associate County Agent (Citrus) at Weslaco.



Redblush (Ruby) grapefruit is red inside and "blushed" outside; ripens early; is sweeter and less bitter than other grapefruit. A Texas redhead gives his approval.

occurred about a hundred years ago.

The Valley, as it is known to most Texans, is a strip of land along the American side of the Rio Grande extending from a point about 10 miles west of Mission to the southmost area in the Brownsville district. The Valley is now about 80 miles long, but it may be extended many miles to the west when water from the Falcon Dam project becomes available for irrigating additional land.

The Valley is narrow in its upper reaches, and the adjacent land is quite rugged; but it starts fanning out into true delta country just west of Mission. The delta is about 30 miles wide from Mercedes on down to the gulf, and much of this fertile, alluvial soil can be irrigated with water from the Rio Grande.

Soils range from the light blow sands along the northern rim of the Valley to the heavy clay soils of the coastal prairie. As with most orchard enterprises, the well-drained, loamy soils are best for orcharding. A fine quality of fruit is produced on the better-drained resaca soils which are somewhat "heavy" in texture.

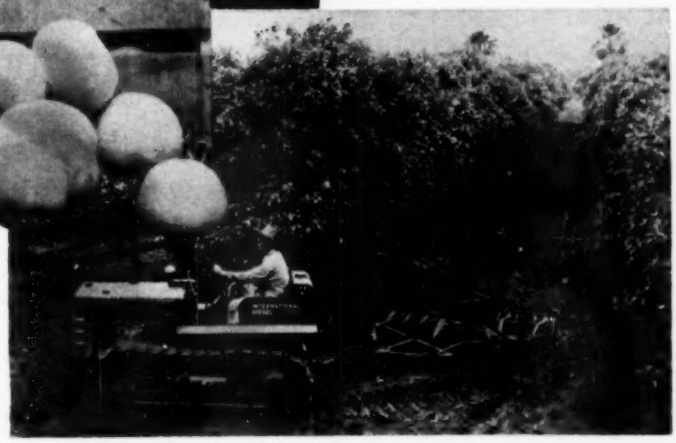
Rainfall is highest nearer the coast (about 24 to 30 inches) and drops off to 18 to 20 inches in the area west of Mission. Fungus diseases such as melanose cause more damage in the humid coastal areas, while scale insects usually cause more damage in the drier portions of the Valley. However, few Valley orchards are ever sprayed for the control of scale as natural (biological) control is usually adequate.

As early as 1920, it became quite evident that the Valley was well suited for the production of early grapefruit. Numerous orchards were started about that time with stock brought in from California and Florida. Marsh Seedless grapefruit ripens much earlier in the Valley than it does in its "native" state and has a much milder flavor, having less acidity and less bitterness. In fact, it was the ideal breakfast fruit until the pink-fleshed sport, Pink Marsh, was discovered and popularized.

Extensive plantings of Marsh and Pink Marsh grapefruit and some oranges (about 20 per cent) were made during the period from 1926 to 1928. The Engleman Development, Bayview, Progreso, Goodwin's, Adam's Gardens, and Delta Orchards were some of the larger blocks of orchards that were planted during the late twenties.

It was these large, corporate-type developments that really "put the Valley on the map" as a fruit-producing area. Production reached the 20-million-box mark within a 10-year period and peaked at 37 million boxes in 1947, just 20 years from the time

(*Continued on page* 54)



Citrus fruit is produced under a wide variety of conditions in the Valley of the Rio Grande and high-yielding orchards are found on clean-cultivated, sandy loams.

Valley demonstrated that good oranges could be grown in this area. These dooryard plantings of oranges were made more than 60 years ago, but the first orchards were not planted until about 1908, or soon after rail communication with the "outer world" was established.

The original Spanish grants of property, which were made principally to war heroes, were long, narrow *porciones* of land with some river frontage. Even at that early date the importance of riparian water rights was recognized by land owners. During the early days the Rio Grande was navigable, and intercommunication between Valley ranches was largely by river boats. All of this

Widespread use of post-bloom hormone sprays assures Michigan growers of annual crops of market-sized fruit.

CHEMICAL FRUIT THINNING

By A. E. MITCHELL, *Michigan State College*

BLOSSOM THINNING of apples has been used for many years to increase fruit size at harvesttime and to induce annual bearing of varieties with biennial bearing habits. Blossom thinning was first performed by hand but this method was laborious and too expensive to be practical. Later, sprays of dinitro compounds (DN) were found to be effective. In Michigan, however, the DN compounds have been replaced by naphthaleneacetic acid (NAA), and blossom thinning with this material has become a standard orchard operation.

When DN compounds are used for blossom thinning, the spray is applied as soon as the lateral flowers of the blossom clusters are open. By this time the central flower, which opens before the laterals, has set and the stamens have become brown and withered. To be effective, this type of thinning spray must be timed correctly so as to destroy the stigmas and styles of the opening lateral flowers. Otherwise these flowers will set fruit.

Fruit growers in Michigan prefer to use naphthaleneacetic acid (NAA) for thinning instead of the DN compounds for three reasons:

1) The timing of the spray is not so vital.

2) The application may be made sufficiently after bloom to evaluate fruit set and determine the need for thinning.

3) The application may be made when the leaves are more mature and are less likely to be injured by the spray than they are at full bloom.

Since NAA was first introduced commercially in Michigan five years ago for fruit thinning, new findings have eliminated a great deal of the speculation first associated with this method. It is no longer necessary to make spray applications during or immediately after full bloom. In fact, effective fruit thinning has been accomplished with applications as late as three weeks after full bloom.

This gives the grower opportunity to evaluate blossom set, allow for spring frost, and regulate the thinning operation accordingly. The opportunity to thin by spraying sufficiently after bloom to determine the need for thinning, is something long desired in apple growing.

As a guide for those in Michigan interested in using NAA for fruit thinning, H. D. Hootman, extension fruit specialist at Michigan State College, has suggested the following concentrations for various varieties of apples:

1) 10 p.p.m.—McIntosh, Delicious, Northern Spy, and Jonathan.

2) 15 p.p.m.—Grimes, Oldenburg, Fameuse, Hubbardston, and Wagener.

3) 20 p.p.m. — Baldwin, Yellow Transparent, Wealthy, and Golden Delicious.

Ten parts per million (p.p.m.) is four grams of pure NAA in 100 gal-

(*Continued on page* 56)

State NEWS

• Indiana Denounces Federal Apple Purchase Program
• Winter Meetings Emphasize Marketing Problems

INDIANA—In a resolution passed during the annual meeting of the Indiana Horticultural Society in Indianapolis on January 11, Hoosier growers voted unanimously against government subsidies. Asking for a return to the American heritage of free enterprise, they demanded discontinuance of the apple purchase program and asked that the funds thus saved be used to reduce the disgraceful cost of federal government.

Pointing out that the apple purchase program does not fulfill the needs of the growers and often results in depressing the market, the lengthy resolution charged that the administration of the program was so seriously mishandled that the program was set up to help only two states, with the result that growers of the remaining 30-plus apple-producing states suffered losses totaling millions of dollars.

"We value our independent way of life too highly to lose it by continuing down the one-way path of subsidies, regimentation, and federal dictation," said the Indiana growers. They asked that the USDA discontinue price manipulation through the apple purchase program and that all subsidies, socialistic practices, and welfare state plans be stopped.

OREGON—Manpower problems for farmers will get darker before they are eased. That's what Glenn E. Brockway, regional director for the U. S. Bureau of Employment Security in San Francisco, told 500 members of the Oregon State Horticultural Society during its 66th annual meeting.

Brockway's seven-point solution to present and future farm labor problems included: maximum use of local labor, full use of workers on the job, better use of labor between crop areas, removal of recruitment obstacles, maximum use of migrant labor, use of military personnel while on pass or leave, and finally, use of nondomestic laborers to fill local critical needs.

New president of the Oregon State Horticultural Society is Tom Harper, Junction City, succeeding Ward Spatz of Medford, who will serve as a trustee. First vice president is C. King Benton, Jr., of Hood River. Secretary is C. O. Rawlings of Corvallis.

Morrie Spatz, brother of the 1951 Oregon society president, died recently. The brothers operated the Crystal Springs Packing Company and orchards located at Medford.—*R. G. Fowler, Jr., Information Specialist, Corvallis.*

CONNECTICUT—The subject of MARKETING keynoted the 61st annual meeting program of the Connecticut Pomological Society, held in Hartford, and it was interesting to note the attention given the speakers. Five years ago a marketing session would have cleared the hall!

All the speakers stressed the fact that growing the crop was only half of the fruit grower's job—that it is the GROWER'S job to sell his crop if he is to make a profit.

George Warncke, Wilton, received the "Certificate of Distinction," presented by secretary emeritus, H. C. C. Miles. The H. C. C. Miles scholarship award, presented by the society to an outstanding student in pomology at the University of Connecticut and carrying with it a check for $100, was given to William Benedict, Stepney.

Officers elected for 1952 included: President, Charles R. Bishop, Guilford; vice president, Norman H. Barnes, Sr., Wallingford; secretary, Sherman P. Hollister, Storrs; and treasurer, Nelson B. Cooke, Branford.—*S. P. Hollister, Sec'y, Storrs.*

NPC CONVENTION

The National Peach Council will hold its annual convention at St. Joseph, Mich., on February 18, 19, and 20, 1952. Headquarters will be Hotel Whitcomb. The program, in which peachmen from all sections of the country will take part, will primarily cover marketing problems, with special emphasis on merchandising, says Dr. M. J. Dorsey, secretary, 1502 S. Lincoln, Urbana, Ill. A forecast of the 1952 crop will be made.

VIRGINIA—How to reduce costs and increase sales were problems thoroughly discussed at the joint meeting of the American Pomological Society and the Virginia State Horticultural Society at Roanoke, January 7-9. Worried by the upward trend of production costs, Virginia growers are turning to power pruning, concentrate spraying, chemical thinning, and other laborsaving devices.

International Apple Association's Samuel Fraser pointed out that the apple industry's No. 1 problem is the high cost of labor. Confident that growers can solve their problems without government control and regimentation, Fraser envisioned a mechanical apple picker of foam rubber, suction sweepers, and an elevator arrangement.

A. E. Mitchell of Michigan State College

(*Continued on page 28*)

FRUIT PEST HANDBOOK

(TENTH OF A SERIES)

CODLING MOTH

Above — Codling moth adult. Right — Codling moth larva and pupa within cocoons from beneath bark of apple tree.

APPLE and pear growers throughout the United States have to deal with the codling moth, or apple worm. This pest is especially abundant and hard to control in areas having a long growing season and high summer temperatures—most of the arid sections of the West, the southern apple-producing sections of the Middle West, and the coastal plain areas of the Middle Atlantic states.

The moth is nearly a half-inch long, brownish gray in general color, with coppery or golden markings. The moths usually first begin to appear in the orchard soon after apple blossom time, and are present for six weeks or more. Soon after coming

(Continued on page 64)

CALENDAR OF COMING MEETINGS AND EXHIBITS

Feb. 1-2—Utah State Horticultural Society annual convention, Newhouse Hotel, Salt Lake City.—Gene H. Oberly, Sec'y, Logan.

Feb. 6-8—West Virginia State Horticultural Society annual convention, Martinsburg.—Carroll R. Miller, Sec'y, Martinsburg.

Feb. 7-8—Idaho State Horticultural Society 57th annual meeting, Hotel Boise, Boise.—Anton S. Horn, Sec'y-Treas., Boise.

Feb. 14-15—Fruit Conference, University of Georgia, Athens.—Geo. H. Firor, Extension Horticulturist, Athens.

Feb. 18-20—National Peach Council annual convention, Hotel Whitcomb, St. Joseph, Mich. M. J. Dorsey, Sec'y, Urbana, Ill.

Feb. 18-23—Florida Citrus Exposition, Winter Haven.—Phil Lucey, Gen. Mgr., Winter Haven.

Feb. 20-22—Ohio State Horticultural Society 105th annual meeting, Cleveland Hotel, Cleveland.—C. W. Ellenwood, Sec'y, Wooster.

Iowa Fruit Schools or Combination Fruit and Vegetable Schools: Feb. 6—in Davenport; **Feb. 7**—in Dubuque; **Feb. 12-13**—in Burlington; **Feb. 14-15**—in Council Bluffs; **Feb. 19-20**—in Sioux City.—W. H. Collins, Sec'y, Iowa Fruit Growers Assn., Des Moines.

Winter and Spring Meetings of Michigan Societies: Feb. 14—Kent-Ottawa Horticultural Society, Grand Rapids. **Feb. 20**—Southeastern Michigan Horticultural Society, Pontiac. **Mar. 5**—Ionia-Montcalm Horticultural Society, Ionia, Michigan State Horticultural Society annual spring district meetings: **Feb. 20**—in South Haven; **Mar. 11**—in Hart; **Mar. 18**—in Traverse City.—H. D. Hootman, Sec'y, East Lansing.

June 11-13—National Apple Institute annual convention, Hotel Chinook, Yakima, Wash.—Truman Nold, Exec. Sec'y, Washington, D. C.

Aug. 25-27—Northern Nut Growers Association 43rd annual meeting, Rockport, Ind.—J. C. McDaniel, Sec'y, Urbana, Ill.

STATE NEWS

(Continued from page 27)

told growers that he had found in one experiment with concentrate spraying that 2X concentration compared to dilute spraying gave nearly half the amount of russeting under Michigan conditions. He pointed out, however, that the chief cause of russeting in Michigan is low temperatures in May. When the temperature dropped below 32° russeting occurred. He found that sulfur caused more russeting than ferbam on Red Delicious and McIntosh but that the reverse was true on Jonathan.

Concerned about declining apple sales, growers were interested to hear Max Brunk of Cornell University point out that consumer-packed apples in combination with bulk retail displays resulted in increased sales.

Virginia society president Robert J. Rea of Mt. Jackson, urged that funds collected for promoting Virginia apples be increased from one cent to three cents. He pointed out that whereas the citrus industry spends up to six cents a box for advertising, the fresh apple industry spends less than one cent.

Growers unanimously resolved to set up a plan whereby greatly increased funds will be made available to promote both fresh and processed apples. Another resolution called for a joint grower-processor committee for the state of Virginia alone as well as elimination of the price differential between table culls and tree-run apples sold to processors, and discontinuance of the practice by processors of receiving fruit without setting the price.—*R.T.M.*

IDAHO—Gem County's first fruit inspector, Fred Baisch of Emmett, died recently at the age of 82. Mr. Baisch also had served as county commissioner. A fruit grower and a lover of plants, he tested many varieties of filberts, pecans, and Persian walnuts in his orchard at Emmett.—*Anton S. Horn, Sec'y, Boise.*

(Continued on page 66)

WASHINGTON FRUIT LETTER

- **High Consumer Purchasing Power Predicted for 1952**
- **USDA Alerts Growers to Equipment and Chemical Shortages**

By LARSTON D. FARRAR
Washington Correspondent, American Fruit Grower

CONGRESS, wary in an election year, will pass fewer "major" measures, outside of appropriations, than in any year in a long time.

Agriculture in general and the fruit industry in particular will be neither helped nor hurt by Congressional moves. The total to be appropriated will be around $85 billion. That amount of money, injected into the economic bloodstream along with that from private sources, will mean continued high demand for quality foodstuffs.

From the standpoint of the economy generally, 1952 will be much like 1951, although the "dip" that characterized consumer purchases during the summer and early fall of 1951 likely will not be repeated this year. Consumer income is rising, month by month. It is a matter of history that people eat more and better food when they have money in their jeans.

Demand for fruits of all kinds ought to be stronger in 1952 than in 1951. And unless there are record yields, prices ought to be firm.

These prognostications do not take into account a general war, or the beginning of new "police actions," *a la* Korean War, in other areas, such as perhaps Indo-China, Iran, or Yugoslavia.

THE Federal Trade Commission continues to show vigilance in protecting the consumer from advertising that misrepresents the contents of food and drink products. It has closed without prejudice a case in which Mil-Kay Orange Corporation of America, St. Louis, Mo., had been charged with misrepresenting that the bottled beverage Mil-Kay is composed principally of orange juice.

The case was closed only after the corporation had deleted the word "Orange" from the corporate name and had discontinued the use of display card advertisements challenged by the original complaint.

THE value of maintaining in good repair the equipment you now have, and of planning ahead on your equipment needs so as not to be "caught short," cannot be over-emphasized, in the opinion of USDA experts.

Secretary of Agriculture Charles F. Brannan, besides appealing to all farmers to get out the scrap and to maintain their usable machinery, has asked the farm equipment industry to gear its production and distribution of repair parts according to the needs.

The Secretary disclosed that the comprehensive survey conducted by the department last spring indicated that farmers would require approximately 20 per cent more repair parts each month than they received in 1949.

"We believe that this percentage should be considered a *minimum* requirement for 1952," Secretary Brannan said. "With limited materials allotments, most manufacturers will find it necessary to earmark a much greater than normal proportion of their materials for the production of repair parts if requirements are to be fully met."

THE USDA has outlined the prospective 1952 supply situation for insecticides, fungicides, and herbicides (weed killers), coupling the resume with a warning that farmers ought to buy as much of their potential needs as possible and use storage on their farms if it is available. This warning has been carried here in other months.

As the USDA points out, forward buying by farmers and storage on the farms reduces the pressure of manufacturers' storage stocks and helps prevent sudden unmanageable strains on shipping and storage during the growing season.

Farmers unable to buy now for lack of storage facilities or other reasons *could* help by placing orders for future delivery of their estimated needs for agricultural chemicals. This enables manufacturers to gauge accurately the expected annual requirements. Also, buying now might prove more economical, since historically the lowest-price period is the between-the-growing-seasons period.

Every possible effort should be made to obtain maximum re-use of metal drums. Under no circumstances should drums used for weed killers be re-used for insecticides and/or fungicides.

USE of a new chemical spray—known as EH-1 or Crag Herbicide-1, has been shown by co-operative experiments of the USDA and a number of state agricultural experiment stations to control weeds in strawberry beds, according to announcement here. The new herbicide is known technically as sodium, 2,4-dichlorophenoxy ethyl sulfate. It is closely related to 2,4-D but is not as toxic to strawberry plants. The new herbicide is expected to be available this season.

NIP SCAB IN THE BUD!

KOLODUST IN THE RAIN...

Timely Protection When It Counts

The surest way to control scab is to *dust in the rain* with Kolodust when scab spores are shooting. This Niagara planned operation is most effective because Kolodust is the only material that penetrates the rain drops and adheres to foliage, buds and fruit both during and after the storm.

Kolodust is *safe*. Being non-caustic it permits foliage to function in a normal manner. You benefit from larger leaves, smoother fruit finish and more fruit buds for next year's crop.

Remember, you can Kolodust when ground conditions bog down sprayers; time applications "on the nose" for maximum kill of scab spores.

This year follow the pattern of better growers everywhere. *Kolodust in the rain!* You'll harvest a bigger crop of finer finished fruit.

BE "JOHNNY-ON-THE-SPOT" WHEN SCAB SPORES ARE SHOOTING

Niagara INSECTICIDES, FUNGICIDES AND ORCHARD DUSTERS

Niagara Chemical Division
FOOD MACHINERY AND CHEMICAL CORPORATION
Middleport, N. Y., Richmond, Calif., Jacksonville, Fla., Tampa, Fla., Pompano, Fla., New Orleans, La., Greenville, Miss., Harlingen, Tex., Pecos, Tex., *Canadian Associate:* NIAGARA BRAND SPRAY CO., LTD., Burlington, Ontario.

WHEN YOU BUY Niagara YOU BUY PROTECTION
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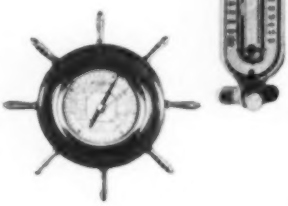
EXCLUSIVE Non-caustic Kolodust contains fused sulphur adsorbed into Bentonite by an exclusive Niagara process. The end result is a highly penetrating dust that sticks to foliage and fruit through prolonged and heavy rains.

Be Your own WEATHER MAN

1. Predict Frost
2. Predict Minimum Daily Temperature
3. Predict Rain, Wind
4. Locate New Orchards
5. Predict Best Dusting and Spraying Periods
6. Be Forewarned of Unusual Weather

New Taylor registering "High-Low" thermometer helps predict frost by telling highest and lowest temperatures since last setting, plus temperature now. Tiny steel-cored indicators inside tube stay put till reset with magnet. Helps locate orchards by detecting cold zones. Warns when to start smudge pots $10



Taylor Ship's Wheel Stormoguide helps forecast frost and local storms within next 12 to 24 hours. Much easier to use than an ordinary barometer because it gives detailed easy-to-read forecasts for each change in barometric pressure. Handsome walnut case, solid brass spokes, Stormoguide dial and exclusive altitude adjustment. $18

Taylor Sling Psychrometer. The scientific instrument weather bureaus use to tell relative humidity. Complete with swivel handle, wet and dry bulb thermometers and protective copper case. Taylor instrument Companies, Rochester, N. Y., and Toronto, Canada. (Prices slightly higher in Canada.)

$9.00

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

CLOUD SEEDING STOPS HAIL

IN Oregon's fruitful Rogue River Valley, famous for pear production, a group of fruitmen was discussing the problem of hail damage which frequently is very severe. The previous season over 7,000 acres of fruit were nearly unmarketable as a result of hail.

A letter was sent to forestry officials in Missoula, Mont., requesting information as to the status of scientific developments in the field of weather control. By chance the letter was turned over to us, because we were interested in establishing a "Weather Control" business based on our ideas on how to stop or reduce dry lightning forest fires.

After meeting with the Rogue River Valley Traffic Association of Medford, Ore., an organization handling the problems of the fruit interests, arrangements were made to start on an experimental basis. The project got underway May 14, 1949, one day after the first hail damage of the season occurred, and was continued during the 1950 and 1951 fruit seasons.

Despite numerous difficulties, when our planes were in the air no hail damage resulted from the thunderstorms which in the past produced hail as they moved across the valley.

Determining "Hail Clouds"

We observed hail falling from clouds 9,000 feet high, as well as from clouds as high as 27,000 feet, and soon learned how to distinguish between hail-producing clouds and those which give only rain or snow.

From experience we found that the basic factor in determining how damaging the hail will be is how much the liquid particles are cooled below the normal freezing point. We found that super-cooled or liquid cloud particles at 5,000 feet above the freezing level can produce small hailstones, with damage to various varieties of fruit. Super-cooled liquid particles carried to higher altitudes than 5,000 feet will produce larger-sized hailstones.

We found that weather control is a business where a qualified pilot can earn a year's pay in a matter of hours by being on a standby status all season. This point needs emphasis because on one project last summer we watched a hailstorm, on a California project, do an estimated $2 million worth of damage in 30 minutes, after mechanical trouble grounded one plane and no qualified pilot was available to fly the standby airplane.

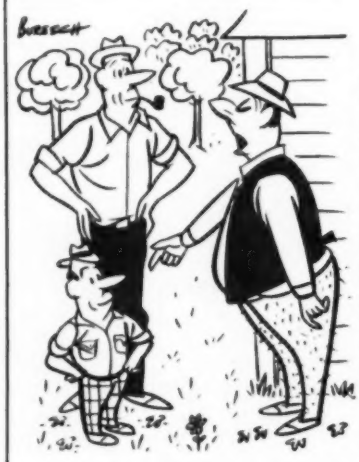
How It's Done

The method for hail prevention we used was to fly through the cloud at the temperature zone which gives the best reaction to the seeding method used. Thus far dry ice, water, silver iodide, potassium iodide, as well as two materials we developed have been used.

Depending on whether the point of hail release is in the upper or lower portion of the cloud, the first material we use starts a precipitation cycle in the lower half of the cloud, whereas the second material works on the upper half of the cloud formation. The material turns vapor droplets to ice crystals, and when there are enough crystals present snow is precipitated instead of hail.

We are very pleased with the results of our hail prevention efforts during the past three years and feel that the prevention of hail is directly a part of our nation's economy as well as our local economy.—*Harvey M. Brandau and Eugene K. Kooser*

The accompanying report is from two former naval aviators, Harvey M. Brandau and Eugene K. Kooser, who in 1949 formed their own company, "Weather Control." With offices in Medford, Ore., they started hail control activities in 1949 and list on their letterhead fog dispersal, precipitation, and frost control as part of their activities. In addition, they claim that they can increase or decrease rain as easily as they can prevent hail. Brandau and Kooser are pioneers in the new science of weather control, and to forecast how far they might go with such age-old problems as precipitation, frost and hail, is staggering to the imagination.—*Ed.*



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- S-W Fix-Mulsion (Dormant oil spray)
- S-W Karbam Black (Ferbam)
- S-W Karbam White (Ziram)
- S-W Mulsoid Sulfur (Micronized sulfur)
- S-W Sulfix Sulfur (Microfine sulfur)
- S-W Sofo-N-Lead (Zinc safener)
- S-W Spralastic (Spreader and sticker)
- S-W Spred-Rite (Spreader and sticker)
- S-W Summer Mulsion (Summer oil spray)
- S-W Stop Drop (Naphthalene acetic acid)

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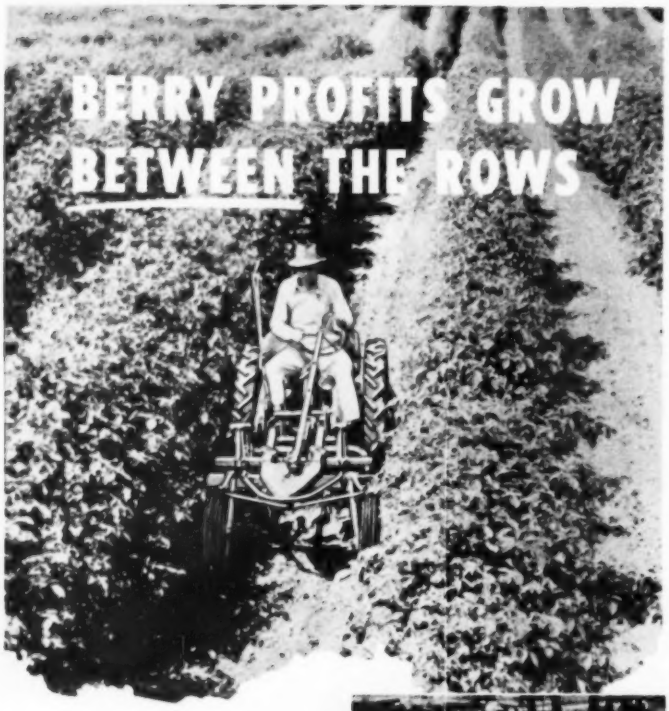

Just climb on the seat of an Allis-Chalmers Model G Tractor to get a good view of how to cut costs in berry growing. Simple, thorough, between-the-row cultivation is the answer.

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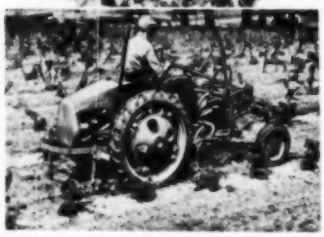

Yes, the Model G Tractor gives you an entirely new outlook on mechanized farming. Its mounted field cultivator, one- and two-way plows, and long line of row-crop cultivators, hydraulically or hand operated, are just a few of the tools that allow you to cut costs *between* the rows of berries and other crops.

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FIVE RULES FOR SPRAYING

WITHIN the past few years there have been many changes in spray practices due to the introduction of better insecticides, miticides, and fungicides, as well as improved spray equipment. There are five rules to be followed which constitute good spray practice:

1) Identify the pest and measure the damage.

2) Select the proper insecticide or fungicide, concentration to use, and method of mixing.

3) Decide when to apply.

4) Know what equipment is best adapted to overcome the pest and best technique of operation.

5) Understand special precautions involved.

Most growers are well qualified to determine if their crop is in danger and are able to identify the pest, but with today's vast variety of spray materials and trade names it is difficult to know what material is best to use. Spray schedules as recommended by state experiment stations and advice of manufacturers and distributors of spray chemicals are invaluable sources of information.

Timing

The timing of sprays is one of the most important rules of spraying. A grower may select the proper spray material but if it is not applied at the right time he may not only waste the material but his time as well.

Newer-type sprayers and dusters have made it easier to spray the entire orchard on time, and the trend seems to be towards the mist machines, boom-type sprayers, Speed sprayers, and the so-called blowers. Also, the airplane and helicopter are being used to apply sprays and dusts on thousands of acres of fruits and vegetables.

Protection for Crew and Crop

In every instance special precautions should be taken to protect the operator and the crop being treated. This includes the grower, his help, and neighbors when applying the poisonous chemicals.

To protect the crop, spraying should not be done when weather conditions are adverse, and when two or more chemicals are mixed a compatibility chart should be carefully followed or a competent authority consulted. The information on the label of the spray material container should be read carefully and special note made of the precautions listed.—*Jack Irby, entomologist and crop protection advisor, Garcia & O'Connell, Sebastopol, Calif.*

THE QUESTION BOX

Is the Turley apple a good replacement for Stayman?—*Ohio*

Ohio horticulturist C. W. Ellenwood reports that while Turley does not have as good quality as Stayman, it does not crack, ripens a week or so earlier, and produces more even crops of uniform fruit. Turley is deserving of a thorough trial as a partial replacement for Stayman.

I have several fig trees—Brown Turkey and Celeste—and have trouble getting them to ripen. Would any of the new hormones be of any help?—*New York*

Your best bet is to apply a drop of olive oil to the eye of the fig which will hasten maturity from one to two weeks. If not applied at exactly the right time, however, it is ineffective. Apply the olive oil after the interior of the fruit has changed from green to red.

There is considerable evidence that some hormone materials will hasten maturity but as yet these materials also cause injury to leaves and twigs and are not safe to use. It is probably only a matter of time until the proper material will be discovered.

Will pruning improve size of fruits?—*New Hampshire*

By cutting away some of the fruit buds, pruning acts to thin the crop which will increase the size of fruit. The amount of increase depends on the severity of the pruning, the proportion of fruit buds to leaf buds, number of fruit buds that set fruit, as well as growing conditions and other factors that affect fruit size.

We are contemplating building a new packing house and would like to know what size is most efficient. We handle the following amounts of fruit:

Cherries—12,000 crates per season
Peaches—10,000 bushels per season
Apples—10,000 bushels per season

—*British Columbia*

The following is a guide of floor dimensions for packing rooms which should prove helpful:

Volume to be packed (bu. per hour)	Minimum feet	Maximum feet	Optimum feet
50	26x30	34x50	34x70
100	32x40	40x90	36x70
150	36x60	40x100	40x80
200	40x80	40x100	40x100

What factors influence the development and severity of fire or pear blight?—*Iowa*

As is true with all plant diseases, certain weather conditions favor the development of fire blight. Temperatures of 70° to 80° with frequent rains encourage the blight. Young, succulent, rapidly growing tissues are easily invaded. Holdover cankers must be present in or very near an orchard to start an epidemic. Any practice such as cultivation or heavy fertilization which increases succulence of growth favors the severity of blight and should be avoided.

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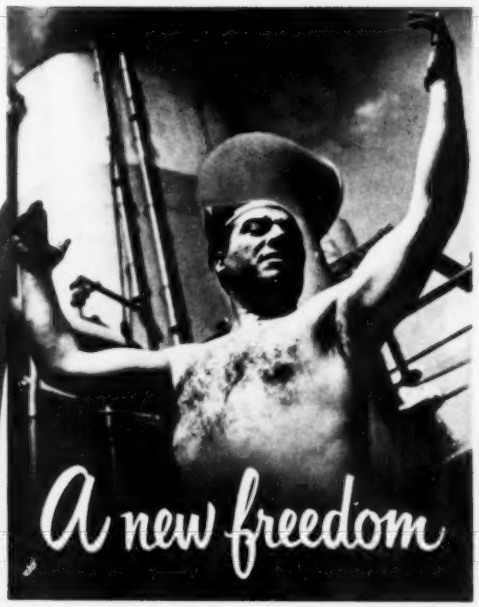

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TIMELINESS IS KEY TO SUCCESS WITH NITROGEN FOLIAGE SPRAYS

By E. G. FISHER
Cornell University

FOLIAGE SPRAYS of urea (Nu-Green, Ra-Pid-Gro, etc.) have been tried by numerous apple growers in the past few years. Some have been well satisfied with the results; others have not. The following discussion will attempt to point out the reasons for both the favorable and unfavorable results of its use, together with suggestions of ways to avoid the latter.

Much of our research work and also grower application have centered on a treatment consisting of about three sprays between calyx and June drop. The number of sprays required will actually depend upon the natural fertility of the soil. Experiments would indicate that over a period of time the tree needs the same amount of nitrogen regardless of the method of application. As many sprays should be applied, therefore, as would furnish the nitrogen equal to an optimum soil nitrogen application. Three sprays would be an average.

Leaf Nitrogen Content

Our field results have always shown that during and immediately following these sprays the nitrogen content of the leaves is high. The decrease in leaf nitrogen after the sprays have been applied is usually more rapid than that following ground application of an equivalent amount of nitrogen. The effects of urea sprays on leaf nitrogen content are more rapid and as great or greater but for a shorter period of time; i.e., the results are more temporary.

Tree Response

Tree response also has paralleled what might be expected from leaf nitrogen analysis. Sprays applied between calyx and shortly before June drop have often shown a marked effect in reducing June drop and increasing fruit set. Our field experiments have usually shown good yields from urea sprays primarily because of the effect on set. This effect on fruit set is particularly marked where pollination has been adequate. If the set is not too heavy the results are desirable; often, however, the effect may be to overset the crop of fruit.

Red color development of fruit is generally best under low nitrogen conditions. The temporary nature of leaf nitrogen effects from leaf sprays has always resulted in at least as good fruit color as from trees receiving comparable soil applications.

Difficulties begin to arise, however, if the set has been extremely heavy and the nitrogen level drops rapidly after the June drop. Decreased fruit bud formation, partially throwing the trees into biennial bearing, and small-sized fruit have resulted. These effects are more marked where the set is extremely heavy and the soil extremely light or low in natural fertility. The remedy for over-set would be to 1) apply the sprays early—perhaps not later than the 10-day spray, or 2) use chemical thinning or very early hand thinning. Especially on light soils precautions should be taken to maintain the nitrogen level of the tree in the latter part of the season by 1) a urea spray after the June drop is over, or 2) light soil applications of nitrogen.

Special Sprays

Some growers do not contemplate a complete urea spray program, but might want to give a special urea spray sometime during the growing season. Our studies on leaf nitrogen have shown that early sprays do not result in as high a leaf nitrogen content in the middle and latter part of the season as do later sprays. Also, tree response from early sprays is small compared with later sprays. Pink sprays may have some effect on increasing early terminal growth but the effect is not great.

Sprays between calyx and June drop have given the most marked effect on increasing fruit set. At least in our experiments the closer the sprays came to the June drop the greater was the effect on set. Sprays after June drop have shown an effect on increasing fruit size and also decreasing red color. The effect the grower desires to obtain should determine the time of application.

Precautions

If the grower is on a complete urea spray schedule he should observe the precautions which have been discussed. In a three or four-spray program the best times for application are 1) one or two pre-blossom sprays, a calyx, and a 10-day spray, or 2) a calyx, 10-day,

and first cover spray. The first program would have the least chance of over-setting the crop but the second would maintain leaf nitrogen a little longer through the season.

Urea Sprays on Other Fruits

The effectiveness of urea sprays has been greater with apples than with other deciduous fruits. Peach trees have not shown adequate response to a complete urea spray schedule. Some New York growers have tried urea sprays to give peach trees a nitrogen boost in midsummer. It is probable that peach trees can withstand a higher urea concentration in the spray than apples; but no definite recommendations can be made at present. Grapes are another fruit which have shown only small responses from urea sprays. Little information is available on cherry response.

Leaf Injury

Occasionally some leaf injury occurs from urea sprays on apples. Observations over several years indicate that healthy, mature leaves are the most resistant to injury. Leaf conditions which favor injury are 1) Unhealthy and yellow leaves due perhaps to a weak root system of the tree or winter injury. 2) Young leaves which are just beginning to expand or any growth present in the early part of the growing season. 3) Leaves injured by lime sulfur or DN materials. Less often injury has been reported when urea is used with mercurial fungicides.

Other conditions which affect the amount of leaf injury are: 1) Some varieties are more susceptible than others. 2) Weather conditions undoubtedly affect the occurrence of injury, but just what the effect is has not been definitely determined. Limited observation indicates that cloudy weather favors injury if there is not enough rain to wash the urea off the leaves. 3) Too high a urea deposit on the leaves or too many sprays over too short a period of time may cause injury.

General suggestions for avoiding injury might be: 1) Avoid the use of urea with lime sulfur, DN materials, and possibly with mercurial fungicides. 2) Use a three pounds per 100 gallon concentration in preblossom sprays and five pounds per 100 gallons after blossom. 3) Allow several days and preferably longer to elapse between sprays. 4) In concentrate applications use urea at a slightly lower concentration than the other materials being applied. However, concentrate applications should be safe if the rate of application deposits on the leaf no more actual urea than would be deposited by conventional methods. THE END

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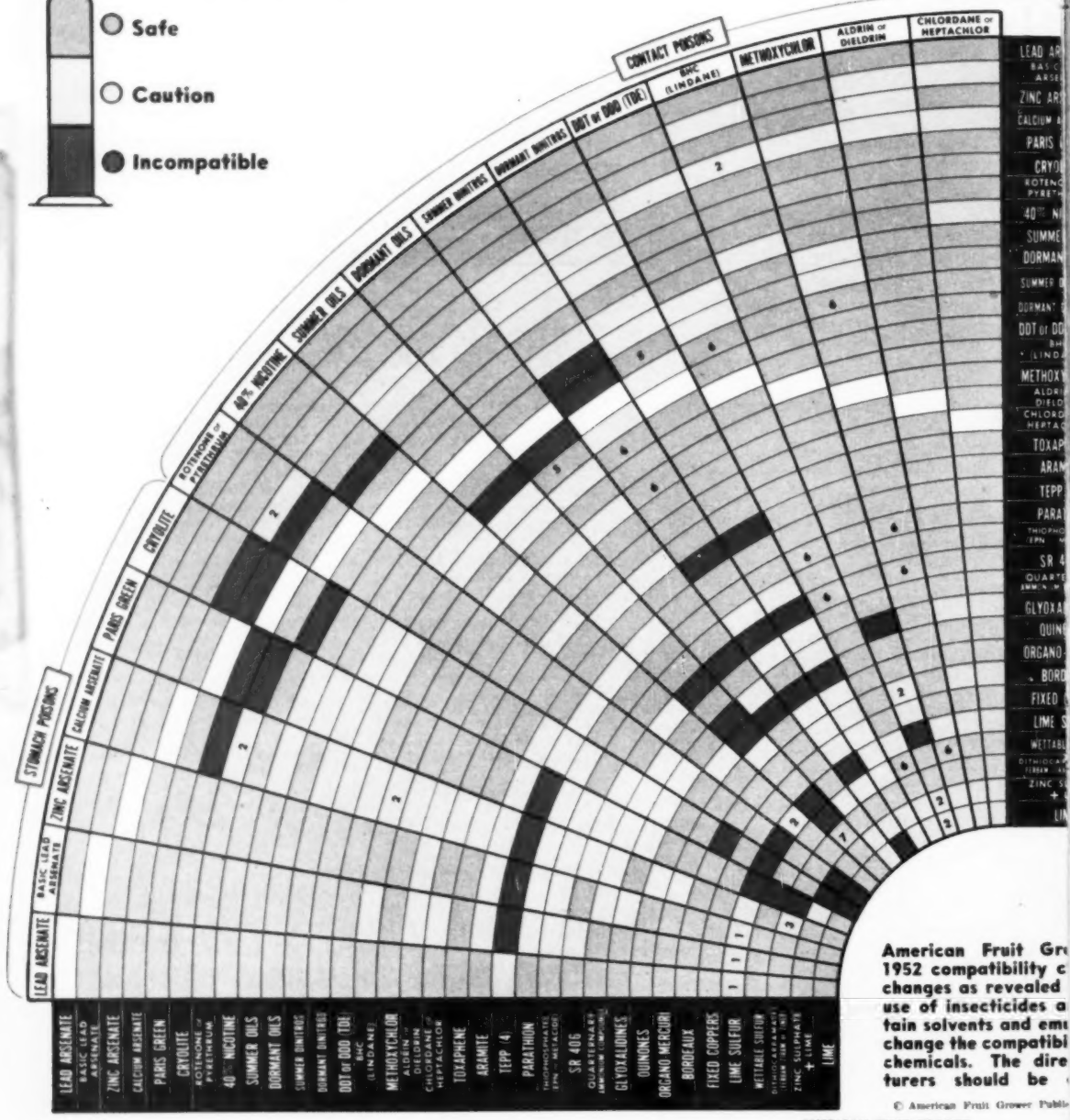

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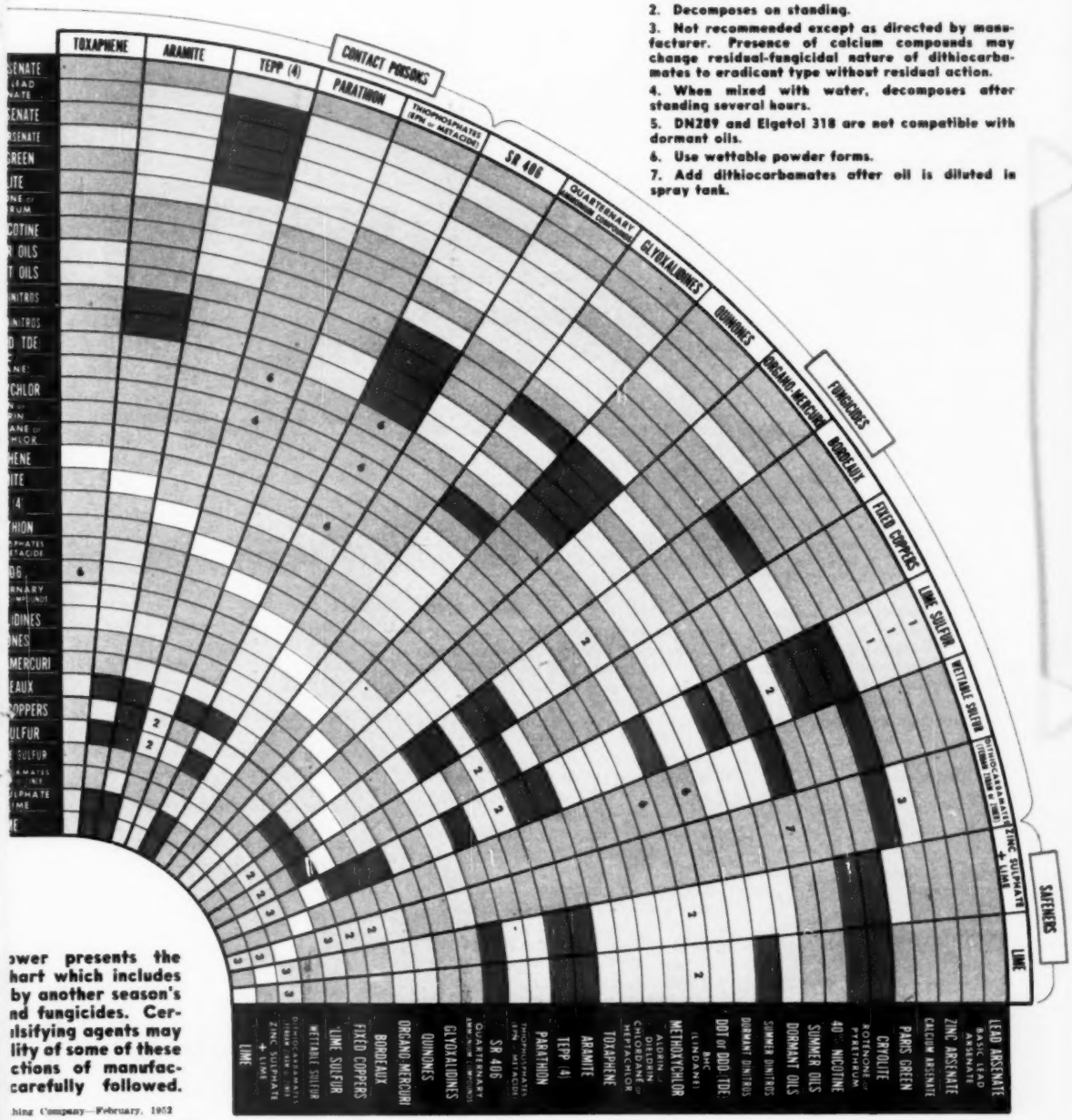

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2. Decomposes on standing.
3. Not recommended except as directed by manufacturer. Presence of calcium compounds may change residual-fungicidal nature of dithiocarbamates to eradicant type without residual action.
4. When mixed with water, decomposes after standing several hours.
5. DN289 and Elgetol 318 are not compatible with dormant oils.
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HISTORY OF HORTICULTURE

A Beautiful Life

By W. H. CHANDLER

THE WORK of scientists and inventors and the experience of growers have made horticulture very interesting, as an occupation and as a field of study. Early horticultural scientists, who could not have the help of much basic knowledge or of the fine equipment now available, still deserve our grateful memory. Dr. J. C. Whitten should be remembered not so much for his published works and the help he gave fruit growers as for the encouragement he gave young plant scientists and especially for the kind of man he was.

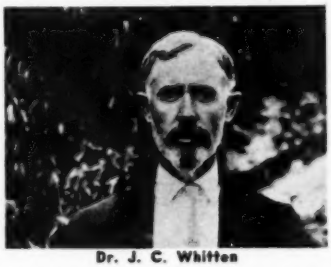
Born the son of a lumberman at Augusta, Maine, September 14, 1866, he graduated and took a master's degree at the South Dakota Agricultural College and had additional training at Cornell University, the Missouri Botanical Garden, and the University of Halle in Germany. He was a professor of horticulture at the University of Missouri from 1894 to 1918, and at the University of California from 1918 until his death on June 5, 1922, in Washington, D. C., where he was helping in a conference on plant quarantines.

He began work when horticulturists were beginning to realize that to be helpful to growers they must learn more about the nature and processes of their plants, but when they or their administrators still thought that their studies, supported by public funds, should give promise of yielding practical benefits rather soon. Individuals as well as the university used so much of Dr. Whitten's time that he was not able to give much direct attention to such research. His contribution through helpfulness to others, however, was great.

When there was dissatisfaction in any part of the state, the university was apt to send him out for conferences and he was exceptionally effective. Any audience gave him rapt attention. And yet he did not seem to me to use any of the tricks or devices of the orator. Thoughts seemed to flow from him as naturally as clear spring water from over a great mossy rock.

The author, Dr. W. H. Chandler, is a former professor of horticulture and dean of the College of Agriculture of the University of California, Los Angeles.

Because of all these uses of his time, his published work is not of great importance in the system of horticultural knowledge that is growing so fast now. Yet I believe he has made great contributions to it indirectly by the encouragement and helpful understanding he gave many other plant scientists in planning their work. We



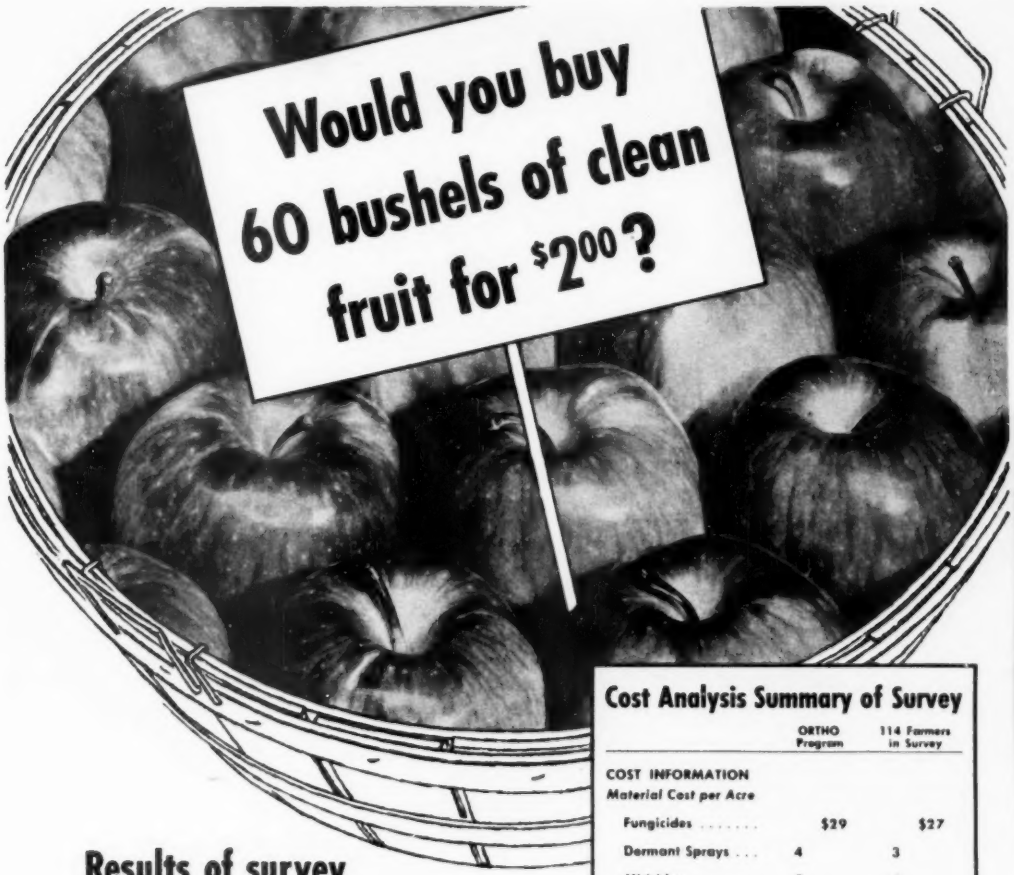
Dr. J. C. Whitten

cannot be certain that some of the work that was the beginning of great progress in our field would have been done as soon except for suggestions from him.

All of us live on in a society as long as it exists, through chains of influence that we start or support. Our visible contributions in publications, structures, or organized efforts may seem to merit for us the gratitude of society, and yet acts or suggestions that we have forgotten may have started chains of behavior that do society harm that outweighs the good we think we may be proud of.

Most of us cannot know what fortunate or unfortunate advice we have given, or other influence we have exerted, has been most far-reaching. Our lives become so hidden in the soul of our culture that none of us can wisely feel very confident of our value to it. We think that life has tended to become nobler as the generations pass and, therefore, that the lives of many people, if not of most, have tended to improve rather than to weaken society.

Dr. Whitten was so free from selfishness or vanity of opinion that I feel certain his life still grows among us only as a rich, wholesome influence, a white light of stern integrity rose-tinted with human charm, human love, and sturdy enthusiasm. THE END



Results of survey among 114 apple growers:

All 114 Farmers: Average reported marketing 83% clean fruit or a net (at the average yield rate of 400 bushels per acre) of 332 bushels.

***ORTHO* Users:** Reported marketing 98% clean fruit or a net (at the average yield rate of 400 bushels per acre) of 392 bushels. Additional cost of an *ORTHO* program was $2.00.

Bonus Yields for *ORTHO* Users: 60 bushels of clean fruit for an extra expenditure of $2.00.

Cost Analysis Summary of Survey

	ORTHO Program		114 Farmers in Survey	
COST INFORMATION				
Material Cost per Acre				
Fungicides		$29		$27
Dormant Sprays	4		3	
Miticides	3		4	
Other Insecticides	27		25	
All Insecticides		34		32
Hormones		1		3
Total Material Cost		$64		$62
CONTROL INFORMATION				
% of Clean Fruit Picked		98%		83%

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FIRE BLIGHT CONTROL IN CALIFORNIA

MOST of California's pear acreage, due to conditions which seem favorable to fire blight in the hot interior valleys, is now concentrated in the cooler districts: the coastal valleys, the Sacramento River Delta, Lake County, and in the Sierra Nevada foothills. Although the coastal districts are usually less susceptible to blight infection than some of the others, in every year in almost every pear producing section of the state, there are some orchards with heavy infestations, and the successful orchardists are those who are continually aware of this hazard.

The "Old Home" variety is being generally used as a "body stock" in new pear plantings, of which there are relatively few. Cultural practices designed to reduce the vigor of the trees, and thus diminish the severity of the disease, are not being emphasized; however, the growers who have had heavy blight damage attempt to reduce the vegetative vigor of their trees by less severe pruning and withholding nitrogen fertilizers. The small non-bearing acreage may be responsible for the de-emphasis of cultural control methods.

The cutting out of blighted twigs and branches, and the treatment of cankers on scaffold limbs, is universal in all sections of the state.

In California possibly 99 per cent of the blight infections takes place through the open blossom, and this is the basis for recommending the copper sprays and dusts which are being used as a supplementary control after holdover blight has been removed.

Recommended Control Program

Late Fall and Winter (Dormant Season)—the early part of this season is preferable for locating blight infections.

1) Remove all infections from twigs, branches, trunks, and roots before the first pear blossoms open, cutting out the twigs and smaller branches and scraping the cankers from scaffolds, trunks, root crowns, and large roots. Disinfect tools and cuts with a solution of mercuric chloride and mercuric cyanide[1]. The addition of glycerine to the solution will prolong its effectiveness.

2) During the early fall as the leaves begin to turn color cankers in heavy wood and roots may cause a more brilliant coloration of the foliage directly above the infection. This is a great aid in discovering "hold-over" cankers.

Spring and Early Summer

1) Starting when possibly 10 to 20 per cent of the blossoms have opened and continuing throughout the blooming season at 4 to 10-day intervals, depending upon weather conditions, apply a 10-90 copper-lime dust at the rate of 40 to 50 lbs. per acre or a ¼-¼-50 to ½-½-50 Bordeaux spray or a fixed copper spray of the same concentration.

2) After petal fall include in the first codling moth spray Bordeaux or fixed copper.

3) Patrol the orchard during and after a blossom period and throughout the spring and early summer and:

a. When blossom blight is found, the first concern should be with the infections on or near the trunk and main branches. Cut out these spurs and shoots and scrape out all infected areas to a clean margin and disinfect frequently all tools and wounds with the glycerine chloride-cyanide mercury solution.

If experienced operators are available, scarifying with liberal use of the mercury disinfectant may be substituted for the scraping suggested above; however, unless the canker is extensive and may girdle a main branch the scraping technique is recommended.

b. In case of an epidemic outbreak with so many infections that scraping will involve more time than is available, then recourse may be had to the use of zinc chloride[2]. Cut shoots and spurs back so as to leave about one-inch stubs as markers and drench these stubs and an area of bark around them with a solution of zinc chloride. The area covered with the solution should be extensive enough to be sure that it is somewhat greater than that occupied by the blight organism. The strength of the zinc chloride solution will vary with the condition of the tree, age of wood treated, and experience of the operator. As a rough guide, the following concentrations are suggested: Trees over 15 years 53 per cent; 10-15 years 43 per cent; 8-10 years 33 per cent; under 8 years 23 per cent. These concentrations are for trunks and branches with scaly bark; smooth bark will take the next lower concentration.

c. After the trunks and large branches have been treated the blighted spurs and shoots on the upper and outer part of the tree are removed as promptly as feasible, being certain to cut well below the last visible signs of blight, and disinfecting all cuts and tools with the mercury solution.

d. Remove the numerous, apparently healthy shoots which spring up from the trunks and crowns of the trees during the spring. Disinfect tools and wounds.

e. Continue to patrol the orchard during the weeks which follow, re-

moving all new infections and any old ones previously missed.

Later Summer and Early Fall

1) Continue to patrol the orchard and remove any possible infections developing from late blossoms. Disinfect.

The extent to which the control program outlined above should be utilized will depend upon the blight hazard of the district, the current severity of the disease, and the weather conditions during the blooming period.

This destructive disease has been and still can be held in check, even in districts favorable to blight, by present control methods when skillfully and intelligently applied by experienced operators.—*Warren P. Tufts, University of California.*

1, 2 Directions for the preparation of these solutions should be obtainable from the local county agent.

DRILLING WELLS WITH PLASTIC PIPE

SHOWN below is a new type well drilling machine which utilizes plastic pipe as casing and which completes wells in a fraction of the time and at less cost than usual methods. In a recent demonstration a 61-foot water well was drilled, cased, piped, and pumped in only 125 minutes.

The packaged-unit portable drilling rig may revolutionize well drilling methods, and offers fruit growers a chance to develop to a greater extent existing underground water supplies because of the cost and time savings.

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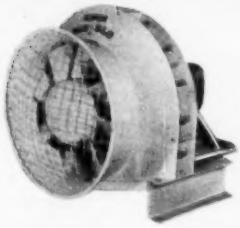

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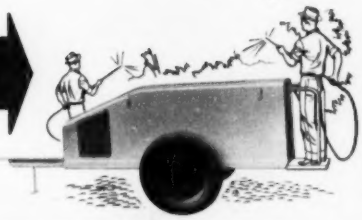

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INSECT CONTROL

(*Continued from page* 15)

trolled by the use of parathion; mites of the same species in other greenhouses were almost immune.

During the past year a similar situation seems to have developed with certain orchard mites in a few localities in the East and in the Northwest. Information is too incomplete for any conclusions in this this matter, but it may be necessary to turn to other miticides for controlling the strains resistant to parathion. Fortunately, there is a long list to turn to and preliminary tests indicate some of them are effective against the resistant strains.

Speaking of resistance, entomologists have been watching for resistance to DDT on the part of the codling moth. Thus far, nothing definite has been observed. Occasional failures or partial failures to control worms have occurred but there has thus far been no reason to believe that the development of resistance to DDT has been responsible. Rather, the reason has appeared to be a tendency to skimp on the spray program.

After trying for many years to find something better than lead arsenate for curculio control on peach, entomologists now have available several effective materials. Parathion and certain related materials that contain phosphorus are much more effective than lead arsenate and have certain advantages over benzene hexachloride and chlordane, materials that displaced lead arsenate to some extent earlier.

During 1951, outstanding results were obtained by a number of workers with dieldrin, one of the newer chlorinated hydrocarbons. Unfortunately, the label claims for dieldrin have not been approved, because of toxicity of this material to human beings and inadequate information concerning the hazard to consumers of the small amounts on harvested fruit. Further study may show that dieldrin can be used, at least in the early-season applications, with safety from a residue standpoint. For the coming season it is unlikely to be available except for experimental work.

Systemic Insecticides

Progress in the use of "systemic" insecticides has been slow. When applied either to the soil or to the leaves of the tree, such materials enter the sap stream and cause it to be poisonous to insects. In general, these materials are not so promising on tree fruits as they have been on some of the herbaceous plants.

Because of its low residue hazard, methoxychlor (a close relative of DDT) may find increasing use in orchard spraying. It has given good results in the control of the plum curculio on apple, the cherry fruit fly, the apple maggot, the Japanese beetle on fruits and other crops, and the grape berry moth. It is reasonably effective in controlling the codling moth, although not quite equal to DDT.

"Malathon" is a recently adopted common name for one of the newer phosphorus materials. Any appraisal of malathon is very preliminary, but it seems to be effective in the control of many of the common orchard mites, the woolly and other apple aphids, and the pear psylla. It may prove useful against some other orchard pests. Chemically, it is S-(1,2-dicarbethoxyethyl)-o, o-dimethyl dithiophosphate. Growers may have heard of it under the code designation 4049.

Accumulations in Soil

The danger of injurious accumulations of the newer insecticides in orchard soils seems a little less serious

OVER 95% CLEAN FRUIT AT ONE-HALF THE COST

• 1951 SPRAY RECORDS SHOW EVEN GREATER SAVINGS

SO STATED Harry A. Hatcher, Manager for Thomas S. Smith & Sons, probably the largest growers of fruit in Illinois. During 1951 three additional BUFFALO TURBINES were purchased and used exclusively through the entire Smith orchards at 8x concentrate with all insecticides and fungicides.

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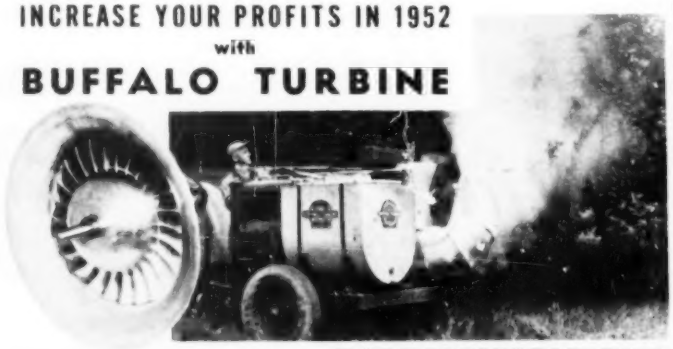

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now. Although there has been little or no effect on orchard trees, there have been indications that accumulations of the new materials may injure cover crops, or certain crops grown after the orchards have been removed.

For a number of years it appeared that DDT would remain in the soil indefinitely with little change. However, recent work in New Jersey has shown that DDT applied to turf begins to break down after four or five years, and that two-thirds of the quantity applied may disappear by the end of six years. Some of the other organic materials disappear more rapidly. Within 12 months, two-thirds of the aldrin and one-third of the dieldrin are gone. Thus, any bad effect of accumulations of the new insecticides in the soil will probably be temporary.

More and more growers are using the mist blower type of equipment, and are applying insecticides as "semi-concentrates" with only one-eighth to one-half as much water as formerly. The extremely concentrated solutions of DDT and other new insecticides, that have been used so successfully in the control of forest insects at rates as low as one gallon per acre, haven't proved practical for use in orchards. The semi-concentrates, however, have given, on the whole, nearly as good results as the conventional spray mixtures as generally used through most of the last half century.

Residue Hearings

The record of the spray residue hearings is still in the process of review in the Federal Security Agency. The analysis of the mass of information presented has been a monumental job. Although the initial announcements regarding probable tolerances may be made this winter or spring, it seems unlikely that any tolerances will become final until after the end of the coming growing season. THE END

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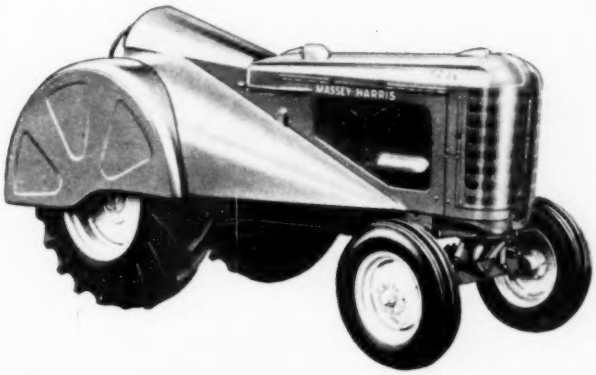

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The Massey-Harris 44 Orchard Tractor is specifically designed for grove and orchard work — built low to get close to trees that are pruned low — shielded to protect blossoms, fruit, and operator — with more power than any other tractor in the 3-4 plow class . . . power to handle a big disc in heavy cover crops, to pull the spray rig up hill.

With all its power, the No. 44 is a surprising fuel-saver. You cover more acres on fewer gallons.

You'll find the No. 44 easy to handle. Its tread is less than 4 feet wide — lets you get in between trees. Short 11-foot turning radius. Weight is placed low — safe to operate on hillsides — yet has full axle clearance. Quick-turn, shock-proof steering. Hydraulic-mounted Velvet Ride seat softens jars and jolts. Five speeds forward. Positive brakes, light pedal pressure. See your Massey-Harris dealer . . . mail coupon for free catalog.

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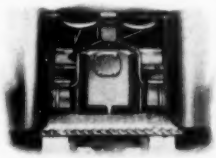

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Providing this essential protection demands a careful study of each individual hazard. At M.S.A., in the world's largest research laboratory devoted exclusively to safety, men with many years of experience in developing respiratory protective equipment bring their knowledge to these problems. Whatever the threat, these men come up with masks that let workers breathe in safety.

Matching the right breathing protection to the hazard is not a new business here at M.S.A. We've developed masks to guard against hundreds of different toxic conditions in every industry. So when new insecticides brought new hazards to that "Good old Country air"—we were on the job to shield you from them. When you need respiratory equipment, you'll find the best at M.S.A.

Breathe Safely while spraying ...use the M. S. A. Farm Spray RESPIRATOR—Why take chances during outdoor applications of Parathion, E.P.N., Dieldrin, Aldrin and other insecticides when it's so easy to be safe. This compact, comfortable respirator neutralizes light concentrations of organic vapors; halts passage of solid or liquid particles. Cartridges and filters are easily replaced, keeping respirator at peak efficiency. Strong, non-clogging exhalation valve prevents leakage on inhalation. Get all the facts, write for bulletin.

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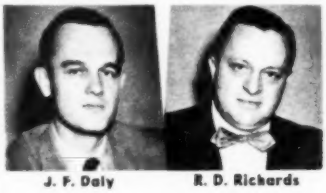
TWO new members of The Hardie Manufacturing Company, Hudson, Mich., manufacturers of the Hardie line of spray equipment, are John F. Daly, executive vice president and general manager, and Richard D.



J. F. Daly R. D. Richards

Richards, manager of sales. Mr. Daly was with the Hancock Manufacturing Company, Jackson, Mich., and once before was a member of the Hardie organization. Mr. Richards was formerly in the sales department of the United States Steel Company.

FRUIT DISEASES

(Continued from page 16)

the trees have previously been sprayed with iron compounds.

Crag Fungicide 341 (glyoxalidine acetate)—This is another organic compound that is being used as a substitute for lime sulfur to control apple scab. The material has given satisfactory control but occasionally injures the finish of the fruit. Crag Fungicide 341 is also being used extensively in place of Bordeaux mixture to control cherry leaf spot.

Orthocide 406 (N-trichloromethylthio - tetrahydrophthalimide)—This is another complex organic compound of recent introduction. It has been used on peaches for control of brown rot, scab, and bacterial spot without causing injury and on apples for control of apple scab and fruit spot. One of its advantages is that it leaves a light-colored residue. It is relatively expensive, a fact that limits its use, especially on peaches where it has to compete with sulfur, one of the cheapest fungicides.

Machines

At present many orchardists spray with the conventional high-pressure machines, others use Speed sprayers, and still others use mist blowers of various types.

Each type has its advantages. The conventional high-pressure machine, if operated by careful workmen, probably gives more uniform spray coverage than other machines now in use. The procedure is slow, skilled labor is difficult to find, and usually there are not enough machines available to cover the entire orchard during critical infection periods. If the

conventional machines are equipped with booms, the labor cost is reduced and the operation speeded up at some sacrifice in uniformity of coverage.

Speed sprayers and mist blowers differ from high-pressure spray machines in the fact that air instead of water is used to distribute the fungicide suspension through the trees. These machines all require less labor and permit rapid coverage of the entire orchard during critical periods. Carefully operated, they give satisfactory control of fungus diseases.

Mist blowers discharge the fungicide under low pressure into the airstream. Many orchardists find it advantageous to operate these machines at night when air movement and evaporation are at a minimum. A mist duster is merely a modified machine which injects water under low pressure into the airstream carrying a fungicidal dust.

Because coverage with these machines is apt to be less uniform than with conventional high-pressure machines, it may be necessary to shorten the intervals between successive applications to get maximum control.

Concentrate Spraying

Decreasing the cost of spraying by increasing the amount of material in a given quantity of water and reducing the number of gallons applied per tree is the latest development in the art of spraying. Using concentrated materials decreases the cost of supplying water for spraying operations. The same amount of fungicide is applied per tree as with dilute solutions, but there is proportionately less water per pound of fungicide and less material is wasted through runoff or drip from the trees.

The successful use of concentrated mixtures requires extra care in mixing the materials, the proper adjustment of the forward motion of the machine to the rate of delivery, and the proper arrangement of nozzles so that the entire tree is adequately covered. At present mixtures concentrated three to eight times are being successfully used by some commercial growers. Concentrate spraying should be attempted only after the grower is thoroughly acquainted with the special requirements of the method.

The method cannot economically be used for small acreages, as the time required to prepare the concentrated mixtures and clean the machine afterwards more than offsets the advantages to be gained in spraying a small number of trees. Likewise, no one machine will be entirely satisfactory or economical for all types of trees. THE END

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November 10, 1951

Attention: Jim Haddan

Dear Mr. Haddan:

Perhaps you will be interested in knowing how we like our Hale sprayer now that we have finished our second seasons use of it.

We have used it on many types of material from the dormant oils in the spring to the hormone materials in the fall. The machine handles all types equally well, agitating them thoroly, and applying them to every part of the tree, even the real large ones.

This was the most difficult season that spray men have ever had in this part of the country. During the early summer and continuing well thru the entire growing season we had rain or other unfavorable weather for spraying 5 to 6 days out of every week.

But despite this handicap we were able to come thru with excellent control of both scab and other fungus diseases and of all of the insects. Because of the speed and thoroness of application of the Hale we were able to get over the orchard on the one or two days a week that it did not rain. We would not want to try to grow fruit with out the Hale.

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It pours . . . it sticks . . . it protects. Fineness under 2 microns surface average diameter. Tops for Dilute and Concentrate Sprays. Your best choice for use in pre-bloom, blossom and calyx sprays on apple and in blossom and early cover sprays on cherry and peach.

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Microfine Wettable Sulphur
Our finest dry-wettable sulphur for use as a spray *or* dust in early cover sprays on apple, peach and cherry. Great for dusting during rains. Excellent for Concentrate Sprays. Fineness under 5 microns surface average diameter.

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Ideal as an in-between-dust in a spray program. Excellent for use on wet foliage or in the rain.

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Not too coarse, not too fine — just right for safe, low-cost, summer sprays on Apple, Peach, Cherry, Plum.

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WILDER MEDAL AWARDS

ONE of the most distinguished prizes in the field of horticulture is the Wilder Medal annually awarded by the American Pomological Society. The medal is named after the first president of the APS, Marshall P. Wilder, in honor of his great service to horticulture in the early days of fruit production.

Now, in its 80th year, Wilder Medal awards were made at the annual meeting of the APS in Roanoke, Va., January 8, to Eugene C. Auchter, Elizabeth C. White, and to a variety of fruit, the Klonmore strawberry.

Dr. Auchter, now director of research at the Hawaiian Pineapple Company, received the award for outstanding service to horticultural interests. Miss White was recognized for her work in breeding and improving cultivated varieties of blueberries. The Klonmore strawberry was honored as one of the nation's leading strawberry varieties and the medal will go to the Louisiana State Agricultural Experiment Station where the variety was originated.

TIMING SPRAYS

(*Continued from page* 17)

work in the blossom clusters. Many blasted flowers spell trouble and many skeletonized leaves in July and August should demand treatment. The best periods for control are dormant and mid-July. Judgment of the necessity for treatment is sometimes difficult since a few infested leaves per tree will cause little loss. Many infested leaves around fruit clusters on the other hand indicate the trees should be treated. Bait pails will show whether large numbers of moths are present.

Codling Moth—No method for determining abundance before damage occurs equals the bait pail. A few scattered around the orchard and supplied with dilute molasses will tell whether moths are present. Observation of early entries in June will also tell whether there has been much activity. Watch the windows in packing sheds around June 1. Here, however, the warning may come too late since moths frequently emerge later from packing shed crates than from outdoor quarters. If nights are cool and sundown temperatures are 65° F. or lower, there is less to be feared than if temperatures remain high. Consider, however, the possibility of a second generation if the season is early as in 1951.

Plum Curculio—The most important activity occurs just after petal fall—from then until July. Watch

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for the first crescents on early apples or fruit from trees around the margins of the orchard near woods. Curculios will not lay eggs before the apple reaches a certain size (about one-fourth-inch in diameter) but this activity may be sudden and extensive. Warm weather before bloom sometimes makes the infestation easier to control apparently because the beetles then go elsewhere for food.

In spray operations consider temperatures. If low, the interval between sprays may be lengthened to two weeks, but, if high (75° F. or above 70° mean F.), intervals of seven days may be necessary.

Apple Maggot—This is one of the most difficult insects to judge in the field. Dependence in part on county agent or extension service reports is good business—to give you the time when emergence starts. Frequently no flies can be seen on the trees until about one month after they begin to emerge, at which time it may be too late to prevent early egg punctures. Successful bait traps have been developed but have not yet been proved for the Northeast. Experienced orchardists can see flies easily when they begin to crawl on the fruit, and from July to September all that is needed is field inspection. One fly seen in five or 10 minutes is enough to give warning that trouble is ahead. Seasons with partially deficient rainfall seem to be worse for maggot damage, but the amount of the infestation during the preceding season is also important since it determines the carryover and number of puparia in the soil.

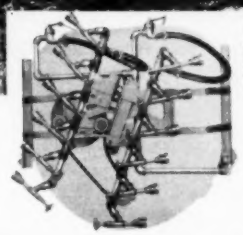
Mites—Two species are currently troublesome, three in certain localities. Predictions of outbreaks based on number of winter eggs on twigs or mites on the bark are not always reliable. Sprays at the delayed dormant or pink and calyx period have great value, but continual watch must be kept throughout the season for one or another of the species. Incipient outbreaks of the European red mite can usually be detected by off-colored or bronzed foliage, particularly the first leaves to unfold. Experienced orchard men can locate mites without hand lens inspection, before serious damage is done. Mites in general do not develop in very damp rainy weather and they may be more severe where heavy sulfur-lead arsenate schedules are followed or where much DDT has been used.

Red-banded Leaf Roller—Moths emerge early and are sometimes seen shortly after petal fall. The insect is not easily detected until the larvae begin to feed on the leaves. Watch

(*Continued on page* 48)

one man now does work of six with a

Myers Concentrate Sprayer



NEW MYERS SILVER CLOUD SPRAY HEAD *can be mounted on any sprayer. Provides complete coverage with one man operation. Automatic operation in 3 positions for varying spray heights.*

Operated by one man, the Myers Concentrate Sprayer covers more acreage than two dilute units with six men. Produces better quality fruit because the small droplets in the oscillating high pressure air stream penetrate the heavy, dense foliage and protect all parts of the tree.

Many other outstanding advantages over conventional sprayers. Spray chemicals are reduced by ¼ since concentrate spraying does not drip—it all stays on the tree. Complete coverage is obtained with $\frac{1}{10}$ the water needed in dilute spraying—tank requires 50% less filling time. Use coupon for complete information.

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you know that for some fifty years the Friend trademark has stood for steadily increasing dependability, economy, efficiency and utility. No matter how perfect the machine, how satisfied the user, Friend has not sat back and rested on its reputation. Instead, it has pioneered new developments such as the *first* power sprayer . . . the *first* true spray gun . . . the *first* completely lubricated sprayer . . . the *first* one-piece welded steel sprayer frame . . . the *first* flat-top round tank . . . the *first* cut-under mounting . . . and dozens of others. Today, Friend has the most progressive management in its long history, and you can look forward to even greater benefits. Every year the Friend trademark will mean more to you than ever before!

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find out for yourself why thousands of successful growers call Friend equipment the "most dependable" and "most satisfactory" in every respect. Fifty years of research, development and testing — specifically directed to making your job easier and more profitable — stand behind the Friend trademark on every unit.

FRIEND AIR-BLAST SPRAYERS . . . for "concentrate" and "semi-concentrate" spraying. Of direct centrifugal-flow design, they develop penetrating high-volume, high-velocity air flow for either or both sides . . . throw a finer spray in a more uniform air pattern . . . are 15 to 20% narrower . . . save thousands of pounds in hauled weight, cutting both fuel and time costs.

FRIEND PRESSURE SPRAYERS . . . with the world-famous Friend Pump . . . the pump with fewer moving parts, instant packing adjustment, quick-clean valves that can be stripped in three seconds, score-proof cylinders and tapered roller bearings. Capacities from 3½ to 60 gals. per min. at pressures up to 800 lbs. . . . power takeoff or engine driven . . . on skid or 2- or 4-wheel trailer chassis.

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TIMING SPRAYS

(*Continued from page 47*)

for them on watersprouts about as soon as anywhere on the tree. The later generation appearing in July is more generally distributed. Treatment of the second generation is necessary only if the insect is abundant and there appear to be enough infested leaves near the fruit to provide potential damage. When numerous, sprays are usually needed the last of July or first of August.

European Apple Sawfly — This comparatively new pest apparently needs accurate timing for control. The flies emerge early and are dependent on warm sunny weather during bloom for egg-laying. Since the young larvae feed for a short time within the calyx cup, it is important to spray before the calyx cup closes or just as soon after petal fall as possible.

Leafhoppers — Because of increased effectiveness of the newer insecticides timing is not the problem it used to be. Applications can be made almost any time the insect appears in sufficient numbers.

Peach and Plum Insects

Plum Curculio—Plums must be protected before any other fruit. The only easily applied criterion of activity here is appearance of crescents on small fruit. On peaches the first sprays in this area go on as the shucks push off. Both peaches and plums must be protected following the first spray for about three weeks.

Oriental Fruit Moth—Twig observation and bait pails afford fairly accurate means of estimating abundance and time for sprays. Bait pails have been very satisfactory. Like the codling moth, the Oriental fruit moth is adversely affected by cool nights and low sundown temperatures. Also, a very early season may produce a larger third generation than a late season. Late varieties are usually more heavily infested than early, but this depends in part on temperatures and the way the broods happen to develop. Bait pails will tell whether moths are abundant in time to make the necessary applications.

Borers—The peach tree borer and lesser peach tree borer apparently require different timing. The lesser borer comes out several weeks earlier, and the trunk sprays must be started in mid-June. The peach tree borer is not usually seen until July and treatments in mid-July or early August will suffice. If paradichlorobenzene or similar chemicals are used, it seems to be important to get them on before soil temperatures

fall; or in this locality, before mid-September.

Pear Insects

Pear Psylla—With newer insecticides timing is not so important as formerly thought necessary. However, some growers are still using the older materials. Oil sprays must be gotten on as the buds break and before blossom buds separate—to avoid injury, in part. Three generations a year indicate needed watchfulness in both July and August.

HANDY ANDY

Orchardists will find this home-made spray seat, devised by Jack Burton, Hillsborough County, Hollis, N. H., just the thing for preventing unnecessary fatigue on tough spraying jobs. Burton made his spray seat by welding a three-foot section of two-inch pipe to the base of an old cultivator seat. Then he welded another three-foot section of pipe, three inches in diameter, to a steel plate. A smaller pipe with a seat was fitted inside the base pipe. Burton drilled holes at four-inch intervals in the three-inch pipe and inserted a bolt to hold the seat at the desired height. He then drilled about three holes in the base plate and sprayer platform and bolted securely. The seat revolves with the workman. —Charles L. Stratton.

Populations of one nymph per leaf are certainly enough to warrant control sprays.

Quince Insects

Quince curculio and Oriental fruit moth are both late feeders on the quince and require attention from July 1 on. Timing here means only a continuous cover between that date and the first week in September, possibly later in late seasons. A good rule to follow is to spray every 10 days or two weeks, beginning the first of July. THE END

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One gallon makes 800 gallons of spray.

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Instantly water soluble. Leaves no visible deposit. Can be applied with common insecticides and fungicides.

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Effective, too, for brown rot blossom blight of cherries and peaches, and certain other plant diseases.

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New York, N. Y.

ANOTHER SEASON WITH CONCENTRATES

(*Continued from page* 18)

there was an annual increase of at least 10 per cent in gallonage of spray applied due to increased growth of the trees; the upward trend would have continued.

In 1950 and 1951 the gallonage per tree was held to about one-sixth the amount which would be used in dilute spraying; but it was found possible in many applications to use less toxicant per tree where pests had been held at a low level. The irregularity in gallonage per year is due to seasonal variations in weather and pests and to treating some areas with different concentrations.

Refilling Operation Simplified

It will be noted that the hours of use of the sprayer decreased only moderately but that the use of a refiller rig with its driver has been almost eliminated. This was aided by the installation, in June, 1951, of three well-distributed standpipes to supplement the single filling location we had up to that time.

What about effectiveness? Again, using the same type of sprayer throughout, the results on five-acre plots at three concentrations were as follows:

Table 2. Control of scab and insects at three concentrations, 1949-51. Burrell Orchards, Peru, N.Y.

Concentration		2X %	4X %	8X %
Total Scab	1949	0.1	0.2	0.1
	1950	0.1	0.2	0.1
	1951	0.6	1.5	1.5
Total Insect Injury	1949	3.1	7.0	3.9
	1950	2.3	2.4	2.7
	1951	0.9	0.1	0.5
Russet	1949	2.1	1.0	1.5
	1950	1.2	2.6	1.1
	1951	0.5	1.1	0.7

Obviously, control has been satisfactory under these conditions. However, in several instances, New York state investigators at the Geneva, N. Y., Experiment Station have found results less satisfactory with a Speed sprayer using dilute sprays than where hand spraying was done from the ground using a single gun with a regular high pressure sprayer. A Speed sprayer seemed to give poorer control at 4, 6, or 8X concentration than the same machine with dilute sprays.

Underleaf Coverage Important

Notable among these examples of inferior control with concentrate sprays applied with the Speed sprayer are tests with red-banded leafrollers and two-spotted mites, both of which require underleaf coverage.

Why are these experimental results less favorable than those of the Burrell Orchards and a number of commercial growers who use Speed sprayers successfully at 4X concentration?

The disappointing experimental results were obtained under conditions of heavy infestations and with the fewest sprays that would be expected to give control. In the Burrell plots infestations had been held to rather low levels by consistent spraying and more applications in earlier years.

Furthermore, the Geneva spray deposit data show much lighter coverage in the sections of the trees farther from the outlet of the sprayer. The Burrell deposit data show differences in the same direction, but only moderate differences in deposit in the different parts of the tree.

Finally, Burrell may have had a more nearly adequate proportion of the discharge in the upper portion of the air stream and air deflectors that resulted in a stronger blast *into* the center tops of the trees, thereby putting more deposit on the lower surfaces of the leaves.

Air Deflectors a Necessity

With standard equipment, Speed sprayers do not afford an easy, convenient means of adjusting the air pattern and direction to suit the particular trees and spacing. Wishing to use a more or less standard setup, the Geneva investigators did not think it best to improvise special air deflectors. But, special deflectors are of increasing importance as concentration goes up and gallonage goes down, so ultimately must be provided by the manufacturer if the Speed sprayer is to become a fully satisfactory concentrate machine. The mist from any concentrate sprayer must be driven by the air blast so that it will strike the lower surfaces of leaves with force or the spray deposit will not be adequate.

A few complaints have been made frequently by growers using a Speed sprayer to apply concentrates. Perhaps the commonest is that with 4X concentration and the nozzle setup suggested by the author, more material is used than with dilute spraying.

The answer is simple. Such a nozzle setup provides large enough discharge to control bad infestations. If control is excellent and the grower wants to reduce the rate of application, he can easily substitute nozzles with a lower discharge rate, making sure that twice as much is discharged in the upper as in the lower half of the airstream. If preferred, he can reduce the amount of material per 100 gallons from 4 times to 3 times the standard amount.

With all kinds of concentrate sprayers, there are frequent problems in mixing. Some brands of wettable sulfur do not have enough conditioner

and soft lumps of sulfur clog the suction strainer. The mixture of lead arsenate and lime often clogs the filling strainer in the top of the tank. Sometimes this can be alleviated by using a strainer of larger size, especially if the aggregate area of holes is increased without increasing the size of the individual holes too much.

Often the grower finds the job of putting the materials in the tank too slow. Sometimes a larger strainer, larger bags of materials, better agitation, and an overflow into the filling strainer help to relieve this difficulty.

Occasionally there is a complaint of too much foaming, which may prevent filling the tank with liquid or cause pounding or too light a delivery rate from the pump. If the troublesome material forms a solution with no solids, as with certain DN sprays, it may pay to temporarily remove a paddle or otherwise reduce agitation.

With Crag Fruit Fungicide, if the Crag is added after the lime and insecticide and just before spraying is started, the foaming is reduced. If this does not provide sufficient relief, a pint to a quart of kerosene in a 500-gallon tank may prove a cheap, satisfactory defoaming agent. The kerosene at these low rates often is used to defoam mixtures of wettable sulfurs, DDT, and lead arsenate without apparent bad effects.

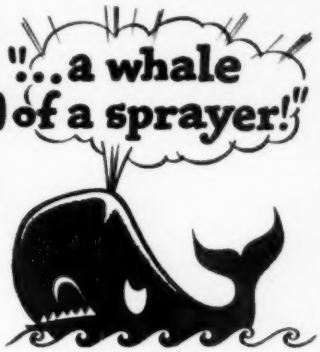
Driving Speeds

Growers sometimes complain that it is necessary to drive too slowly when using concentrates. It is fair to say that the driving speed usually must be reduced by one-half mile per hour compared with the speed for applying dilute sprays with a machine of equal power. This usually is more than offset by much less frequent refilling because a tank of concentrate covers several times as many trees. If a machine of too little power for the size or density of the trees is purchased, it may be necessary to drive at a prohibitively slow speed to get coverage.

Sometimes it is stated that the fine mists of concentrates will not fight as much wind as will full-gallonage dilute sprays. This is true. The faster coverage with a concentrate rig of adequate power may enable the grower to be more choosy of the weather, and any spray outfit works more efficiently in quiet weather. However, if winds are consistently strong, a Speed sprayer owner may be best satisfied with 2X concentration applied with half the number of regular nozzles. The same may be true of other makes of air-blast sprayers if they have ample pump capacity and nozzles designed to give good carry to the spray.

(*Continued on page 52*)

. . . a whale of a spray job doesn't take a lot of time now

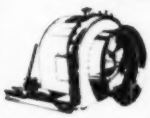


When the spray hits the tree you get pest control if you are spraying with a Hardie. You save time in spraying because you can do it faster without risk of inadequate coverage. Hardie builds sprayers that keep on spraying at full rated capacity and pressure hour after hour, day after day. Hardie design and rugged construction assure freedom from breakdowns and service troubles. Hardie high pressure sprayers, air blast dilute and concentrate sprayers and Hardie orchard and row crop dusters embody many exclusive features that cut the time required to do the job.

High Pressure Sprayers—High pressure means speed in spraying. Eleven sizes of high pressure Hardie pumps delivering from 3 gpm at 250 psi to 80 gpm at 1000 psi are mounted in a wide variety of models.

Air Blast Sprayers—There is no loss of air velocity or volume in Hardie Air Blast Sprayers for the air goes directly from the fan blades into the spray stream. Large and small units.

Orchard and Row Crop Dusters—The Hardie top-feed hopper is only one of many features that eliminate time loss in application of chemical dusts.



Bio-Spray—Any grower with a high pressure sprayer can make it a one-man air blast sprayer by merely attaching a Hardie Bio-Spray.

One-Man Spray Booms—Amazing speed of spray application without sacrifice of coverage or waste of material can be achieved with Hardie special orchard and row crop big volume spray booms for high pressure sprayers.

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PITTSBURGH PLATE GLASS COMPANY
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CONCENTRATES

(*Continued from page* 51)

Despite the automatic features of most concentrate sprayers, more careful and studious observation and adjustment are required than for dilute spraying. Growers with large air-blast sprayers who do not wish to observe the precautions necessary for higher concentrations may like the savings made possible by double concentration, using half the number of regular nozzles and operating as in dilute spraying. If the nozzles with which the machine is equipped do not give fairly distant carry, it may be wise to consider using some that do.

Up to now, satisfactory specifications for concentrate nutritional and for thinning sprays have not been worked out.

Conversion Units Available

For considerably less money than required to purchase an air-blast sprayer of comparable capacity, conversion units are available for regular high-pressure sprayers. They consist of an engine, a fan, and a set of nozzles to be mounted on the back of the regular sprayer. A valve to turn the spray on and off is mounted on the tractor. These units make a one-man outfit out of the sprayer. With appropriate screening, agitation, and nozzles, they may be used for either dilute or concentrate sprays.

These machines are best adapted to smaller, well-pruned trees since the air blast may not be strong enough to cover large, dense trees with concentrate mists. Nozzles such as those in the Hurst attachment seem to provide a maximum of "carry," though the breakup close to the sprayer is less than with conventional high-pressure nozzles, and the spray is coarser where the Hurst nozzles are adjusted for distant carry. This attachment seemed better suited to dilute or 2X to 3X concentration than to applications of more concentrated mixtures.

Summary

Concentrate spraying requires even better observation and a more thoughtful approach than regular spraying. It is not a magic way to avoid the need for a large power plant. A grower purchasing any piece of equipment must be sure the capital investment is justified by his financial condition and his scale of operation. Under some circumstances a single concentrate application is not quite equal to a dilute application. However, experiment and grower experience are accumulating to show that substantial savings in manpower and increased speed of coverage are possible with semi-concentrate or concentrate spraying if the outfit has sufficient power. THE END

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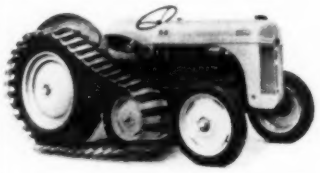
It is no longer necessary to work around those soft spots. All steel Half-Tracks will pull your heavy spray rigs through. It will assure you of getting your early sprays on in time, will also give you constant speed at all times, which is so necessary for complete and uniform coverage, when using an air blast sprayer.



If your problem is soggy spots, loose soils, rough ground, or steep hillsides Blackhawk Half Tracks will pull you through.

Designed in either 13 or 16 inch widths and will drive from any leading tractor tire tread. Fits either Ford or Ferguson tractors.

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Columbia & Okanogan NURSERY COMPANY
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ESTABLISHED 1906
From Coast to Coast it's "C&O"—Plant Box—Watch For Green!

WE LIKE CONCENTRATES

(*Continued from page* 19)

There are many factors which may have contributed to our good control. First, parathion is a wonderful insecticide; it seems to be the answer to the southern peach grower's prayer. Secondly, we may have been favored by good weather, especially insofar as bacterial spot is concerned. Thirdly, timeliness and speed of spray applications played an important part.

A word of caution about our program: We are using a heavy concentration of parathion. But, we have a special mixing tank, one man is solely responsible for mixing and spraying, and we use every recommended safeguard such as chemical masks, proper gloves, clothing, etc.

In addition to our regular spray program we use extra sulfur during bloom and preharvest, depending upon the weather. We like the dilute lime sulfur and also use it in combination with wettable sulfur. The mist-type sprayer is most effective with the above materials.

Summary

We have used the mist-type sprayer with concentrates for three years at a great savings in time, labor, machinery, and materials. We have secured almost perfect control of all insects, including scale. We have been most pleased with our control of scab, brown rot, and bacterial spot. Our only conclusion must be that concentrate spraying is effective.

We are not entirely satisfied with the machine which we have used, as it is not entirely suited to our conditions. It is our understanding that the manufacturers are rapidly improving their designs and that the new machines will be better adapted to our conditions. When our pathologists come up with a fungicide that is as remarkable in its field as parathion is in the insecticide field, then indeed the peach growers' utopia will be at hand —at least until something else breaks loose. THE END

APPLES AND APPLE PRODUCTS

By R. M. Smock and A. M. Neubert

A new and valuable reference book on the composition, nutritional qualities, factors affecting quality, storage methods, and preservation of apples. Latest information on all apple products is given, including dried and dehydrated apples . . . apple chops . . . dried applesauce . . . apple flour . . . canned apples and applesauce . . . canned dessert apples . . . canned baked apples . . . frozen apples and applesauce . . . brined apples, etc. Apple juice, syrup, and concentrate are discussed in detail as well as apple candy, jelly, and butter.

486 *pages. Illustrated with many tables, charts and photographs.*

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TOTAL $1.00	TOTAL ..... only 50.2¢

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Huntington
Wheeling

RIO GRANDE VALLEY

(Continued from page 25)

the boom started. Fabulous returns were realized from good citrus orchards during the war years (1940-45) and the acreage was expanded to the point where there were about 14 million citrus trees planted in orchard form by 1949.

The Important "Ruby"

The Redblush (Ruby) grapefruit was discovered in the Valley as a bud sport of Pink Marsh Seedless about 20 years ago. Redblush grapefruit has all of the good qualities of the parent Pink Marsh variety. In fact, it is a bit sweeter and less bitter than any other grapefruit; and it has eye appeal inside and out. Fully one-third of the acreage which has been planted to citrus in the Valley during the past 10 years was of the Redblush type. It now appears that almost half of the new acreage planted after 1950 will be set to red grapefruit.

Valley growers are counting on this mild-flavored, attractive, seedless variety to dominate the fresh grapefruit market; and technicians report that concentrate made from Valley-grown, red-fleshed grapefruit is a very acceptable product. The Valley is pinning its hopes to fame as a fruit-producing area on its own creation—Redblush grapefruit. Oranges can be produced in many parts of the world, but Valley-grown grapefruit is something special; and Valley Redblush grapefruit is "extra special."

Citrus fruit is produced under a wide variety of conditions in the Lower Rio Grande Valley. High-yielding orchards are found on the clean cultivated, sandy loams and on the untilled resaca soils of rather heavy texture. Very few Valley trees are sprayed regularly to control scale insects but some growers regularly spray for the control of melanose disease. Practically all growers use sulfur for the control of rust mites.

Very few growers plant cover crops, but many use sod culture and keep native weeds and grasses under control with mowers or stalk cutters. Most successful orchardists use some fertilizer (mostly nitrogen) but many trees have been grown to maturity without the use of commercial fertilizers. Water seems to be the prime factor in fruit production and quality and quantity are both important. Salinity is a troublemaker in many orchards and soil drainage and good irrigation practice are closely correlated with high productive ability.

Terrific Freeze Damage

To all fruit-producing areas freezes must come. The Valley has had its share, but the grandpapa of all the

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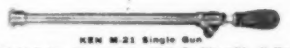

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freezes occurred during the winter of 1950-51. Millions of trees were killed and other millions damaged. A nucleus of a few million trees weathered the freeze, and many millions of seedlings have been started to rebuild the Valley's citrus industry. No one knows whether it will ever be rebuilt to its former status but it seems quite certain that much of the better land will be planted to grapefruit and orange trees. The success attained by thousands of growers with Valley orchards will encourage others to "try the game."

Cotton is presently being grown on thousands of acres of Valley citrus land. Some of this was grown as an intercrop in citrus orchards and some of it on land that was cleared of hopelessly damaged citrus trees. Cotton and citrus fruits are the two principal crops of the Lower Rio Grande Valley and King Cotton is "holding the line" while citrus is in the recuperative stage. With average luck the Rio Grande Valley should be producing as much as 10 million boxes of fruit by the 1955 season. THE END

AN APPLE BOOK

WHERE is there a book with complete information on the apple, how and where it is grown, varieties and their use, history, processing, suggestions on how to buy and keep apples, and all the facts which food editors and publicity agencies want and need?

This question long bothered Herschel Jones, apple broker of New York City, and a thorough search of all the literature revealed a startling lack of information. In 1950, at the International Apple Association meeting, Jones asked for the formation of a committee to work on an apple book project, and help was quick in coming. Today the apple book is in the process of preparation by Dorothy Skinner, prominent fruit publicist of New York City.

The first edition of 10,000 copies will contain six sections of 16 pages each, together with 16 color illustrations, and will have an attractive cover and binding.

Friends and supporters of the apple may help finance the book by subscribing now for the first edition at $2 a copy. Checks may be sent to the International Apple Association, 1302 18th Street, N. W., Washington 6, D. C. It is hoped that enough copies will be ordered by those interested in giving the apple the widest possible publicity to supply libraries, business contacts, and radio, television, and newspaper editors.

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Don Prokop, Tieton, Washington, uses the Utility Carrier on his Case "VAO" Tractor to haul pear boxes in his Yakima Valley orchard. Mounted in a minute on Eagle Hitch of the tractor, the Utility Carrier lowers to the ground for easy loading, raises by hydraulic control for travel. It lowers again, if desired, for unloading. Heavy items like barrels, drums, big boxes, etc., can be rolled onto the Utility Carrier without heavy lifting.

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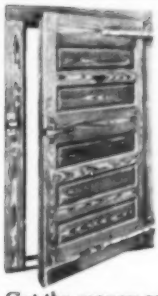

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CHEMICAL THINNING

(Continued from page 26)

lons of spray. It is this concentration that is ordinarily used to prevent preharvest fruit drop. Mr. Hootman qualifies the suggested amounts of NAA listed above by stating that the results of fruit thinning, using any given concentration, are influenced by the weather at time of application, vigor of the tree, and method of spray application.

He also states that it is necessary for each grower to determine by trial the most desirable concentrations for his individual orchard, and he suggests that thinning be tried in a small way the first year to gain experience before thinning on a large scale.

Grower Experiences

Experiences of Michigan growers verify the fact that local and seasonal conditions greatly affect the degree of thinning of apples even with the same concentration of NAA. W. G. Mawby in the Grand Rapids area has used NAA in thinning apples for the past three years with varying results.

In 1951 he made single applications of NAA at 15 p.p.m. in two different blocks of large, bearing McIntosh trees. In one block the thinning spray was applied at early calyx and in the second block approximately one week later (early first cover). The results of thinning were excellent in both blocks. There was, however, less injury to the leaves where the NAA spray was used at the time of first cover.

Another block of Red Delicious and Jonathan trees was sprayed with 10 p.p.m. of NAA at the time of early first cover, approximately two weeks after full bloom. Very little thinning resulted from this application. Consequently, hand thinning was necessary later in the season.

Speed Sprayer Preferred

Although he has both a Speed sprayer and a high-pressure sprayer, Mr. Mawby prefers the Speed sprayer for chemical thinning. He feels that more thinning is accomplished in the lower shaded portion of the trees that otherwise would produce small, green apples. When the number of apples was reduced in the lower portions of the tree, he found that the apples in the top of the tree developed good size and color.

A second grower located in the Grand Rapids area, J. R. Braman, has also had varying results using NAA at concentrations of 10, 12, and 15 p.p.m. in different blocks of McIntosh trees. Where the NAA was used at 15 p.p.m. and 12 p.p.m., no apparent thinning resulted. In contrast, the

application of 10 p.p.m. was quite effective. All applications were made on the same day, approximately 10 days after full bloom, with a Speed sprayer.

Mr. Braman also had very good thinning in a mixed block of McIntosh, Northern Spy, and Red Delicious trees, using 15 p.p.m. on the McIntosh and Red Delicious approximately 10 days after full bloom, and 10 p.p.m. on the Northern Spy trees at the time of first cover. He used the same chemical at 10 p.p.m. on Jonathan at the time of early first cover but thinned the bottom portion of the trees too heavily. Nevertheless, he feels that the thinning application was well worthwhile as the tops of the trees produced a good crop of large, well-colored fruit.

Annual Crops Assured

At the Circle Three Orchards in Fremont, NAA has been used profitably for fruit thinning for the past three years. Before blossom sprays were available, a block of Hubbardston trees averaged approximately 1,200 bushels every other year, with less than 300 bushels in the off-year. Since this block has been thinned using 15 p.p.m. of NAA at the time of or just after full bloom, the yield has exceeded 1,000 bushels annually of large size, marketable fruit.

In 1951 in the Circle Three Orchards, three thinning applications of NAA were made in a block of Wealthy trees with excellent results. The first spray of 20 p.p.m. was applied at full bloom, a second application of 10 p.p.m. at the time of calyx, and a third spray of 20 p.p.m. at first cover. In each case the thinning chemical was added to the fungicide spray mixture being used for the control of apple scab. Applications were close to 10 days apart.

Just before each NAA application, critical observations were made of the developing fruit to see the number not affected by the previous NAA treatment. It was possible to evaluate the degree of thinning since the fruits not affected continued to enlarge while those affected did not increase in size, even though they persisted on the tree until about the time of "June drop." Red Delicious and McIntosh trees interplanted in the Wealthy block were sprayed with 10 p.p.m. of NAA at calyx. Although the material was effective in removing many of the developing fruits, the trees of both varieties carried too much fruit at harvesttime.

The varying experiences of Michigan fruit growers may be due in part to differences in tree vigor. This has been substantiated in part by C. A.

(*Continued on page* 58)

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November 27, 1951

Mr. Olaf Lawrie
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Dear Olaf;

To offset increasing labor costs in our spraying, two years ago we bought an Aqua-Jet spraygoom which was attached to our high-pressure sprayer. The use of this unit eliminated hand spraying and the results obtained were most satisfactory.

We wanted to use more concentrated spray material to further reduce our costs, and last year we bought an Aqua-Jet Blower to replace the boom. We used this unit for our 1951 spraying and had the cleanest crop we have ever had. We used less than one-half the spraying material previously required and cut our costs more than 30%. We had no trouble with this unit and are well pleased with its use.

The Aqua-Jet head atomizes the spray material very well and gives a good pattern. High pressure, plus the Aqua-Jet head and a good blower, is the answer to the spraying problem.

A good clean crop brings top prices. You can't go wrong on Aqua-Jet spraying equipment.

Sincerely,
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You, too, can profit from better, faster spraying at lower cost. Simply by attaching an economical CARDOX Aqua-Jet Blower you convert your present high-pressure sprayer into a super-efficient unit. The Aqua-Jet pays for itself over and over again—makes spraying an easy *one-man job*—greatly reduces the amount of spray material needed to give thorough coverage. Tractor seat control operates the unique Aqua-Jet heads on either or both sides of the blower. Impinging twin jets in each of 6 heads and high velocity blower air-stream project spray 25 to 40 feet. Get the full savings story from your Aqua-Jet dealer today or write us for his name.

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"Why kid ourselves! Good looking apples and peaches sell quickly and are eaten as soon as the family at home sees them. Poor looking fruit is not eaten and then Mrs. Shopper won't buy again.

"YOU can turn out the best graded fruit at lowest cost with Trescott grading, cleaning and sizing equipment. Now when help is so hard to get and keep, an investment in Trescott equipment will pay you bigger dividends than ever.

"We make equipment for all size operations —from small growers to largest packing house—in a wide range of combinations to fit particular requirements. *It will pay you to write us for full details. Specify fruits you produce."*

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Tested and Approved by Most Tractor Manufacturers

CHEMICAL THINNING

(*Continued from page 57*)

Langer of the department of horticulture at Michigan State College who has reported that flowers and developing fruit on weak spurs are easily removed by low concentrations of NAA sprays while those on vigorous spurs are more resistant. Also, differences in spraying practices among growers probably account for some variation in results.

The reason for the widespread use of naphthaleneacetic acid compounds (NAA) in Michigan for blossom and fruit thinning may be summarized by a comment of Robert Anderson of Covert who says that a large crop of small apples is practically worthless even for processing. Since hand thinning is too expensive to be practical, it becomes almost a necessity to use chemical thinning to produce fruit of marketable size. THE END

FIELD ICING HOLDS QUALITY IN CORN

BY helping to prevent rots, decay, and overmaturity, precooling has been proved many times over to be a necessity in maintaining quality in fruits and vegetables. A recent technique is hydrocooling, in which the fruit is immersed in a cold water spray containing a liquid germicide.

A new development in precooling is icing sweet corn in wet-strength paper bags immediately upon being picked. Four dozen ears of corn and 20 pounds of ice are used in each bag, the bags being moved directly to market and put in iced or refrigerated display cases.

Freshly picked sweet corn is especially sensitive to high temperatures which destroy the sugar content and thus the flavor of the corn, causing it to taste flat and starchy. Tests have shown that sweet corn loses 50 per cent of its sugar when stored 24 hours at 86°F. and only eight per cent when stored at 32°F. Most sweet corn handled under ordinary methods has lost half of its sugar content.

A sweet corn project sponsored by the Ohio and National Association of Ice Industries showed that field-iced corn sold more than twice as fast as un-iced corn sold from dry produce racks. Yet the added cost of icing was only 2.26 cents per dozen.

Ice is plentiful, relatively inexpensive, and offers a quick way to remove field heat. Its application to such fruits as peaches, strawberries, and raspberries, as well as vegetables other than corn, may well be the method resourceful growers are seeking to hold that elusive thing called quality.

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FOUR NEW BERRIES

NEW on the fruit variety horizon are four berries—the Eden strawberry, developed by the New York Experiment Station at Geneva, and the Albritton strawberry and Angola and Ivanhoe blueberries, introduced by the USDA.

The Eden is intended primarily for processing. New York station tests indicate that this new strawberry variety makes a satisfactory sliced frozen product, and commercial tests show that it is satisfactory for preserving and canning, says Prof. George L. Slate, small fruit specialist at the station.

The first picking of Eden is made along with or slightly ahead of the Sparkle variety. The berries are said to be large and fair to good in quality.

The Albritton strawberry and the Angola blueberry were selected from crosses under study by Dr. George M. Darrow, USDA, and Prof. E. B. Morrow of the North Carolina Experiment Station. The second blueberry, the Ivanhoe, was selected by Dr. Darrow from experimental plantings in New Jersey.

Heavy Producer

The Albritton strawberry is outstanding as a producer, according to the USDA. In 1951 trials at Willard, N. C., the new variety averaged 360 crates per acre. Yields of the well-known Massey were 280 crates and of Missionary, 188 crates.

Albritton is a mid-season to late variety, ripening the same time as Massey. Its berries have a tough skin and firm flesh that makes them ideal for shipping. The flavor rates good to excellent.

Although tested only in eastern North Carolina, the Albritton appears suitable for production in the East from Delaware south to northern Georgia and in corresponding latitudes across Alabama, Mississippi, Louisiana, and southern Arkansas.

The Angola blueberry ripens in May in eastern North Carolina and earlier than any commercial variety now grown. Its earliness and high resistance to stem canker make it unusually promising for North Carolina where this disease is a serious threat to the crop.

Ivanhoe, the second new blueberry, is noteworthy for its large, light blue, good-flavored berries, and its resistance to canker disease. The new berry is recommended for trial as an early midseason variety in North Carolina and for limited trial north to southern New England.

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From coast to coast, with crops of all kinds, farmers are depending more and more on Gorman-Rupp centrifugal pumps to assure an unfailing supply of water for producing larger and better crops.

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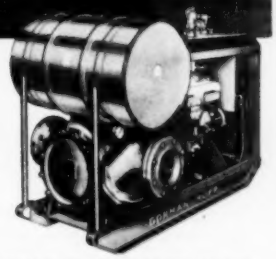

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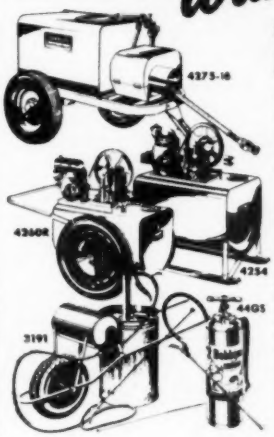

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Many growers* throughout America, like Karl Moser of Coloma, Mich., write us letters commending us for providing a reliable supply of fruit pollens. They find that this scheme reduces their orchard to a factory. *Use hand brush, duster, Bes-Kil siphon, bee hive insert, or airplane for application.*

Due to Hand and Dust Pollination L. C. Antles' Orchard Packed 1,100 Boxes Starking Delicious per Acre in 1951

*A. H. McNeal, Wenatchee, Wash., says: "At the very beginning my crop was increased from 300 boxes to the acre to 1,200 boxes to the acre." *Ray Chamberlain, Cashmere, Wash., says: "I secured pollen from you and started artificial pollination work 12 years ago. The very first year my crop was doubled. Artificial pollination has cost me nothing, because of increased yield."

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THE ORCHARD HOME

Homekeeping hearts are the happiest.
—*Longfellow*

NUTRITIONAL VALUE OF CITRUS FRUITS

Citrus fruits are some of the most important fruits utilized by man. One-half cup of citrus, either in juice or pulp form, provides more than 50 per cent of the daily need for vitamin C. A food plan set up by the United States Department of Agriculture in their bulletin, "Family Fare," indicates from three and one-half to four pounds of citrus a week for men and women and from two to three and one-half pounds for children, depending upon age.

Citrus fruits are good sources of vitamins A, for cell building; B (thiamin), for the nervous system; B_2 (riboflavin or vitamin G), for growth; and especially vitamin C, which protects gums, teeth, and promotes the strength and health of blood vessels. Since vitamin C is not stored in the body, it must be provided for every day. An eight-ounce glass of orange juice for breakfast will provide enough vitamin C for daily protection.

In addition to these vitamins, citrus fruits contain such minerals as calcium, iron, and phosphorus. Another added attraction are the natural fruit sugars which satisfy children's craving for sweets and give needed energy.

The following recipes are suggestions for using citrus fruits:

GRAPEFRUIT SALAD

Salad greens
Grapefruit sections
French dressing

Use any salad greens, and place in a large salad bowl just before serving. Peel chilled grapefruit with sharp knife, removing white membrane with peel. Cut on each side of dividing membranes and remove section by section. Combine salad greens and grapefruit sections in large salad bowl. Add french dressing and toss lightly with salad fork and spoon until each particle is coated with dressing or until well mixed.

—A good suggestion to serve guests on a cold, winter night.

SPICED TEA

Simmer together for eight minutes the juice of 4 oranges and 4 lemons and 2 cups of sugar. In another container, simmer for the same length of time a gallon of water with the following, which have been placed in a bag: 3 tablespoons tea, ½ teaspoon cinnamon, and ¼ teaspoon each of nutmeg,

allspice, and ginger. These may be combined just before use and served hot.—*Mrs. W. W. Miller*

—Here's something tasty for the lunchbox.

ORANGE GINGER BARS

¼ cup shortening
½ cup sugar
1 egg
½ cup molasses
1 tablespoon grated orange peel
2 cups flour
1 teaspoon soda
1 teaspoon salt
1 teaspoon ginger
½ teaspoon nutmeg
½ teaspoon cinnamon
½ cup orange juice

Cream shortening and sugar together. Add beaten egg. Mix in molasses and grated peel. Sift dry ingredients together and add alternately with orange juice. Pour into greased loaf pan and bake at 350°F. for 35 minutes. Cool and slice. Put two slices together with lemon butter frosting.
—*Sunkist Kitchen*

Why not try this for dessert?

ORANGE CAKE

1 cup sugar
¾ cup sour milk
1 teaspoon soda
1 cup nutmeats
1 cup shortening
2 cups flour
1 cup raisins
Grated rind of 1 orange
1 teaspoon vanilla

Cream shortening and sugar; add dry ingredients and sour milk, then nuts and raisins, vanilla, and grated rind. Bake in moderately hot oven, 40 to 50 minutes.

Heat to boiling the following mixture:
½ cup sugar
Juice of one large orange
1 tablespoon lemon juice

Pour this mixture over hot cake. A tablespoon of whipped cream for a topping is very good.—*Mrs. D. C. Wallace*

"Cranberries and How to Cook Them." You will be amazed at the many different ways cranberries can be used. Salads, cakes, sherbets, jellies, and muffins are just a few of many. You may obtain a copy of this useful little booklet by writing the American Cranberry Exchange, 5 South Sixth St., New Bedford, Mass., or 195 South Water Market, Chicago, Ill.

"Nutritive Value of Fruits and Vegetables." Here is an excellent chart which gives valuable information on calories, vitamins, and minerals. For all of you women interested in food values, this chart is a "must." It may be obtained from the United Fresh Fruit & Vegetable Association, 2017 S. Street, N. W., Washington 9, D.C. Single copies are 10 cents.

You may be interested to know that the pamphlet referred to above, "Family Fare, Food Management and Recipes," (Home and Garden Bulletin No. 1) may be procured from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. for 25 cents. This booklet contains a wealth of information on buying fruits, vegetables, and meats; using left-over food; cooking terms; nutrition; and the preparation of food.

For the past 4 years, ELGETOL has been giving excellent results in a combination control program for Apple Scab. ELGETOL is applied as an orchard floor spray in the late dormant, followed by the use of one of the Mercurials in the later sprays. Write for ELGETOL circular describing this orchard floor spray program.

Use Low Cost ELGETOL this year for complete control of aphis, scale, crown gall, and bud moth on apples, peaches, cherries, prunes, plums and almonds. ELGETOL is the original non-caustic, water soluble dinitro dormant spray that is safe and easy to apply.

Try ELGETOL 318 on apples, cherries, prunes, plums and certain cane fruits for controlling aphis, scale, bud moth and light to medium infestations of red mite.

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HOBOKEN, N. J. SACRAMENTO, CALIF.

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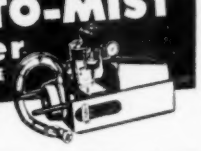
with the
MUTO-MIST Blower
A MUTOSCOPE PRODUCT



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MUTO-MIST does the work of a big spray rig. Using concentrate, it saves hauling hundreds of gallons of water. Every leaf and twig is completely covered, with large savings in labor and chemicals. Weighing approximately 125 lbs., the MUTO-MIST can be safely used on soft ground and steep hillsides. Low in cost, MUTO-MIST is within reach of the small grower, as well as the big orchardist.

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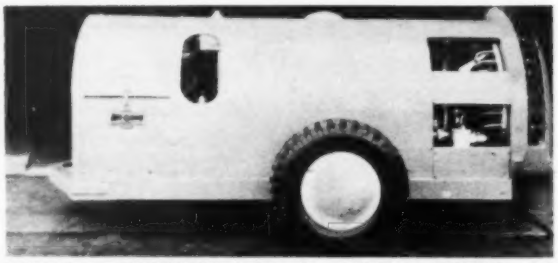
New..Compact..AIR-O-*Spray* DH-403



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From where I sit ... *by* Joe Marsh

Ed Got Red In His Own "Hot Water"

Big Ed started a "Pay-Your-Bill" campaign last week and ended up with a slightly red face. Ed's been our Water Commissioner for ten years, and for ten years now he's been getting riled up over slow payments of bills.

So, he finally decided to do something drastic about it. Last week he sent notices that if the slackers didn't pay up by Friday, he'd shut off their water.

Naturally, some people *still* didn't square accounts. Ed ordered their water turned off, and 14 homes went without water all weekend—the Commissioner's among them. Seems Ed forgot to pay *his* bill.

From where I sit, Ed's mistake is one we all make at times. We are too quick to accuse others while forgetting our own faults. Lots of us do it, for instance, over a difference in taste for a soft drink or a friendly glass of beer. Let's respect each other's preferences and we'll all stay out of "hot water."

Joe Marsh

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NEW FOR YOU

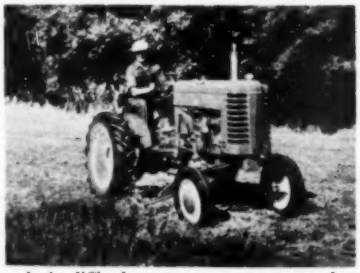
Water and Spraying

Growers are giving a good deal of attention to the 1952 spray schedules. Almost as important as buying chemicals and spraying properly, is determining water hardness. The new Hagan total hardness test takes only a minute and is simple and inexpensive to use. Write Hall Laboratories, Inc., Hagan Bldg., Pittsburgh 30, Pa.

Farmtec Harrowplow

Growers have long wanted a harrow-plow capable of cultivating the heaviest orchard soils and cover crops. The new Farmtec tool is designed to fit all three-point hitch tractors, including Ford and Ferguson. Write Farmers Tool and Equipment Co., 4053 Harlan St., Emeryville 8, Calif., or see your tractor and farm implement dealer.

Center-Mounted Mower



It is difficult to mow cover crops close to the trees when the cutter bar is hidden from view. The new John Deere M-20

- SOIL TESTING KIT
- NEW SPRAY GUN

Center Mounted Mower insures a clear, unobstructed view of the cutter bar. To know more about this worthwhile tool, write Deere & Company, Moline, Ill.

Soil Know-How

It is easy, quick, and wise to learn about your orchard floor with the Sudbury Deluxe Model Soil Testing kit. The new Sudbury booklet entitled, "The Good Earth Can Do You Dirt," is yours for the asking. Why not write Sudbury Laboratory, South Sudbury, Mass. for details?

Sprayers and Dusters

Expertly constructed, the new line of Lowell sprayers and dusters, from small household sizes to large orchard models, is splendidly described in the new Lowell 32-page booklet. Every reader of AMERICAN FRUIT GROWER can have the booklet without obligation by writing Lowell Manufacturing Co., 577 E. Illinois St., Chicago 11, Ill.

A New Spray Gun

The new Brodjet sprayer performs remarkably. Its unique construction gives unusual coverage and uniformity—ideal for small fruit trees, vegetables, and berries. The Brodjet is well-explained in a free booklet which you can easily have by writing Hanson Chemical & Equipment Co., Beloit, Wisc.

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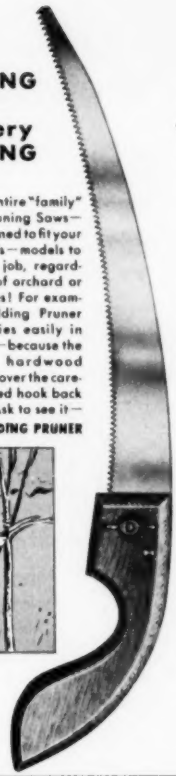
"Silver Steel"

PRUNING SAWS for every PRUNING JOB!

There is an entire "family" of Atkins Pruning Saws—models designed to fit your specific needs—models to do a better job, regardless of kind of orchard or types of trees! For example, the Folding Pruner (right) carries easily in your pocket—because the lacquered hardwood handle folds over the carefully tempered hook back peg teeth. Ask to see it—

No. A-18 FOLDING PRUNER



No. 16—"Silver Steel" blade, peg teeth, adjustable to cut at any angle—accomodates pole of desired length.

No. 40—Tuttle Tooth Pruner. Extra sharp teeth. Kiln dried, top grade hardwood handle. Roomy grip. "Silver Steel" quality!

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1 qt., $1.00; 1 gal., $2.50; 5 gals., $8.50

Prices East of Mississippi River in the states West and South of Ohio and Carolinas: 1 qt., $1.15; 1 gal., $2.75; 5 gals., $9.30.

WHEN YOUR FRUIT TREES LEAF OUT—Pratt's Fruit Tree Spray—now a complete spray in one package for all types of fruit. Is all you need to control chewing insects and fungous diseases during the growing season. 1 lb., $.75; 3 lbs., $1.35.

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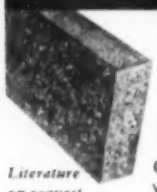

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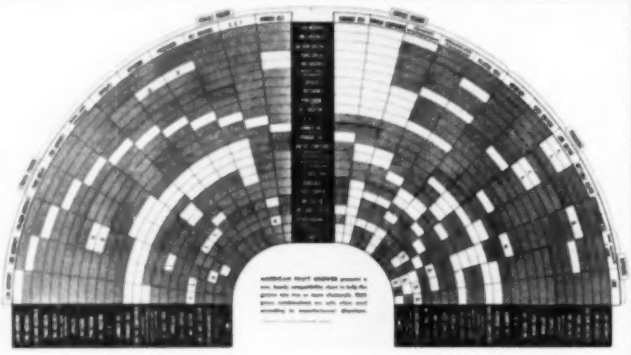

1952 SPRAY MATERIAL COMPATIBILITY CHART

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Enclosed is 25c. Send Compatibility Chart to:

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(Offer good only in U.S.A.)

CODLING MOTH

(Continued from page 27)

out, the moths lay eggs on leaves, usually close to fruit. Later many of the eggs are laid directly on the growing fruit. The freshly laid eggs are about the size of the head of a pin, white in color, flattened and more or less circular in outline.

The worms hatch in four to 20 days, depending on temperatures, and quickly make their way into the fruit. After two to four weeks, the worm becomes full grown, when it is about three-quarters of an inch long and white to pink in color, with a dark brown head. It then leaves the apple and spins a cocoon under a loose flake of bark on the tree, in trash on the ground, or in any other convenient protected place. In the cocoons they transform to moths.

In most localities, a second brood of worms develops during July and August. In localities with a long growing season, a third brood starts before the second is completed. As cold weather approaches, the worms start developing into moths the same season.

Control—Main dependence for worm control is on spraying. Since 1945, DDT has been chiefly used for this purpose. The number of applications required varies in different localities. In the Northwest, the job can usually be done with three sprays of DDT (1 to 2 pounds of 50 per cent wettable powder per 100 gallons): 1) just as the first eggs begin to hatch, usually two or three weeks after petal fall; 2) two to three weeks later; and 3) when second-brood worms begin to hatch, usually during the first half of July.

In many parts of the Middle West, worm control requires at least six sprays of DDT; in most other areas four or five applications of DDT are adequate. The use of this insecticide has often been followed by severe outbreaks of various kinds of orchard mites and certain other pests. These have required further modification of the control programs.

In areas in which worms are easily controlled, as in the more northern apple-producing areas from the Great Lakes region eastward, lead arsenate is still used by many growers. In this way the problems of mite control are minimized. In eastern areas in which the plum curculio is a serious problem on apple, lead arsenate is often used early in the season, since DDT is ineffective against this insect. To avoid excessive residues, the final application of DDT should be made not later than 30 to 60 days before picking time. The strength of the final application should be reduced as much as possible.

The details of the apple and pear spray schedules vary a great deal. The strength of DDT or lead arsenate, the number and timing of applications, the fungicides, the materials added for mite control, and numerous other factors, are different for each locality. Detailed information may be secured from state agricultural experiment stations or extension services.

Numerous supplementary measures are of value in codling moth control. These measures include scraping the bark from the trees to kill the worms in their cocoons, and the use of trap bands on the trunk of the trees; general orchard clean-up; the thinning off and destruction of wormy fruit; and the screening of packing sheds to prevent the escape of moths that have developed from worms that left cull fruit while it was awaiting disposal. Because of the extreme effectiveness of DDT and the high cost of the labor involved, the supplementary controls are now little used. However, under some conditions, they are still worthwhile.—*B. A. Porter, USDA.*

NAMES IN THE NEWS

• **Dr. E. J. Kraus,** professor emeritus in botany from Chicago University, who was named by AMERICAN FRUIT GROWER in 1947 as one of the foremost horticulturists of his time, has been visiting the horticultural department of Michigan State College, his alma mater, for the past month counciling with graduate students, the horticultural staff, and fruit growers. Dr. Kraus is now located at Oregon State College.

• Orchardists and farm equipment dealers throughout New York state will be interested to know that **R. H. Wagemaker** and **W. A. Wagemaker** of the firm of Wagemaker & Son, Inc., Alton, now represent the Buffalo Turbine Agricultural Equipment Co., Inc., Gowanda, manufacturers of the Buffalo Turbine sprayer-duster, a machine specifically adapted for concentrate spraying.

• A native of California, **John F. Fulkerson,** who holds an M.S. in pathology from North Carolina College of Agriculture, is the new spray specialist for the West Virginia fruit-producing area. . . . **C. C. Mullett,** former Newago county agricultural agent who has served the extension service for 22 years, has been named district horticultural agent for northern Michigan, a position left vacant by the death of **Carl Hemstreet.**

• A trip around the world prevented **Lester Collins,** veteran fruit grower of Moorestown, N.J., from serving as delegate to the agricultural convention at Trenton during Farmers Week, January 28-February 2. **C. William Haines** of Masonville was chosen by the New Jersey State Horticultural Society as alternate. . . . Recently married **Samuel Fraser,** secretary of International Apple Association, and Mrs. Fraser are the proud possessors of a Chevrolet automobile, the wedding gift of the entire IAA membership.

• Serving again as president of the Idaho Farm Bureau is fruit grower **E. Duane Bingham** of Emmett, while **Albert Paulson** of Wilder was retained as chairman of the fruit and vegetable committee of the bureau.

• At the beginning of the year the Michigan Cherry Commission moved its headquarters from Lansing to Grand Rapids and appointed its first full time secretary, **T. C. (Ted) Stebbins,** who also has taken over the job of secretary of the Michigan Cherry Producers Association.

• Well-known to readers of AMERICAN FRUIT GROWER for their many editorial contributions are two recently retired USDA plant pathologists, **Dr. M. C. Goldsworthy,** widely known for his investigations of materials for the control of fungus diseases of fruit trees, and **J. B. Demaree,** an authority on pecan and small-fruit diseases.

• Appointed as consultants in an expanding research program underway at the agricultural research center of Dearborn Motors, national marketing organization for the Ford tractor and Dearborn farm equipment in Birmingham, Mich., are three outstanding authorities who have served as agricultural engineering specialists for state universities or extension services—**Prof. Harry B. Walker** of Davis, Calif.; **Dr. J. B. Davidson** of Ames, Iowa; and **J. B. Wilson** of Auburn, Ala.

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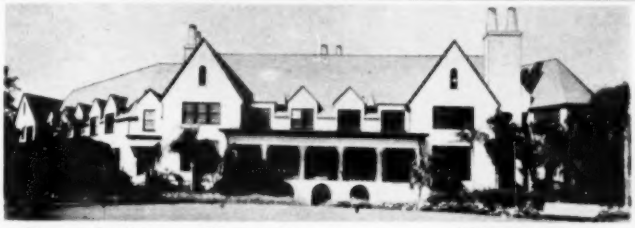

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IAA HAS NEW ADDRESS

Headquarters of the International Apple Association have been moved from Rochester, N.Y., where they were located for over 40 years, to the nation's capital. The new address is 1302 18th St., N. W., Washington 6, D.C. The move was made largely for the purpose of aiding the membership in making contacts in Washington, says Secretary Samuel Fraser.

STATE NEWS

(Continued from page 28)

NEW JERSEY—Some 1,200 members who attended the 77th annual meeting of the New Jersey State Horticultural Society, held recently in conjunction with the Vegetable Growers Association of America in Atlantic City, heard scientists and growers alike relate facts and experiences about new aspects of fruit and vegetable production and marketing.

Raymond Moley, editor of *News Week*, delivered a pointed address under the title, "Freedom Delivers the Goods," in which he criticized some of the trends of our present administration as hindering the development of the farm business. Mr. Moley based his remarks upon what he terms six fundamental principles:

1) A free market is ideal for determining the price of commodities. 2) We must consider the limitations our government has placed on the free market. 3) The great bulk of improvements in agriculture are due largely to what the farmer has done for himself. 4) The farmer's real interest is in the control of inflation and not its acceleration. 5) The farmer's real interest is in expanded production. 6) The farmer must realize that he is in a minority group and must be careful not to become dependent upon a majority group or government for existence.

Experts from four states as well as from New Jersey discussed apple production problems. Dr. A. B. Groves, plant pathologist at the Virginia Experiment Station at Winchester, emphasized that it is necessary to follow rather specific instructions relative to combinations of the newer spray materials. Some of the better combinations which Dr. Groves mentioned are ferbam and DN 111, ferbam and Puratized, and combinations of Orthocide 406. The latter gave the best finish on Golden Delicious.

Dr. E. H. Glass of the New York Agricultural Experiment Station at Geneva, stated that the use of one pound of activated charcoal per 100 gallons of spray eliminated injury from parathion. Among new materials which have given excellent control of redbanded leaf roller, Dr. Glass mentioned Rothane or DDD or TDE as the

Michigan State Horticultural Society officers for 1952 are, left to right: Russel Evarts, Metamora, vice president, H. D. (Don) Hootman, East Lansing, secretary; and C. C. Taylor, Albion, president.

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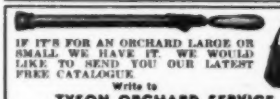

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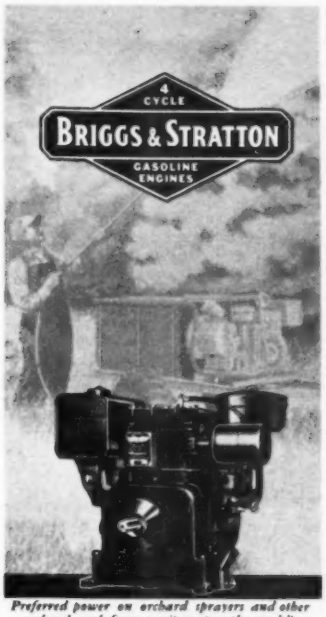

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Many Bargains

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SIMS NURSERIES, Hannibal 2, Mo.

NUT TREES

New hardy English Walnut, Carpathian strain. Rapid grower, bears early, very productive, beautiful shade tree. Chinese chestnut, dwarf fruit trees, berries, new grapes. Guaranteed stock. Catalog free.

J. E. MILLER NURSERIES

545 W. Lake Road **Conesdaigua, N.Y.**

chemical is variously known. He suggested its use at the rate of one pound of a 50 per cent powder to 100 gallons of water.

Dr. F. W. Southwick, horticulturist at Massachusetts State College, Amherst, told New Jersey apple growers they should start using chemical thinning if they have not already done so. Dr. Southwick suggests the use of from 15 to 30 p.p.m. of naphthaleneacetic acid (NAA) with applications being made from calyx to two weeks after calyx. He reported less foliage injury from NAA two weeks after calyx than from applications made at calyx. He further suggested that thinning sprays be made independently of pest sprays since the thinning effect has been somewhat better when applied alone.

Harold M. Rogers, fruit grower of Southington, Conn., reported that the use of six ounces of a commercial preparation per 100 gallons gave good thinning on Kendall, Milton, and Rome Beauty when applied about two weeks after calyx. On Macoun, Wealthy, and Baldwin he used up to nine ounces in order to do a good thinning job.

Officers of the horticultural society elected for 1952 are Hilyard S. Simpkins, Burlington, president; Clinton C. Carlough, Ramsey, vice president; and Arthur J. Farley, New Brunswick, secretary.—*Eldon S. Banta.*

Connecticut grower Harold M. Rogers of Southington gave New Jersey growers attending the annual meeting of their society first-hand information on his experiences with the chemical thinning of apples.

CALIFORNIA—The grape crop recovered from early season setbacks as a result of excellent growing weather and a record crop of 3,099,106 tons is estimated to have been harvested.

A big percentage of the crop went into raisins. To keep from depressing the market, a marketing order was voted in by growers and processors which set aside a portion of the crop in a surplus pool. A. Setrakain, chairman of the Raisin Administrative Committee, went to England and negotiated the sale of the entire surplus pool at $152.50 a ton. The government, in an effort to help the distressed raisin growers, has offered an export subsidy payment to encourage exports. The export subsidy brought the price of the British purchase up to $207.50 a ton or about $160 to the grower.—*Jack Pickett.*

MICHIGAN—More than a thousand fruit growers attended the recent three-day meeting of the Michigan State Horticultural Society at Grand Rapids. A new record in number of commercial exhibits was made with over 70 companies represented.

The most controversial item on the agenda was the discussion of a fruit maturity law. Striking at the practice of marketing apples before they are ripe were Max Smith, J. P. Selby, Otis Klett, and

(Continued on page 68)

Make Hard Work EASY Work with a *Springfield* Garden Tractor

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The handiest tool in your shed is a Springfield garden tractor.

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Your choice of following Varieties While They Last

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Triogem

Regular mail order sizes! Order at once. Stock limited. Trees will be shipped at planting season.

Complete line of other fruit trees . . . Apple, Pear, Plum, Prune, Cherry, etc. Also small fruits. Planters' grades at planters' prices. Write for prices or drop card for FREE copy of our catalog.

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SALES REPRESENTATIVE WANTED TO COVER Mid-West as manufacturer's representative. Experience selling orchard sprayers desirable but not necessary. Good salary and expenses. Write stating qualifications and requirements. AMERICAN FRUIT GROWER, Box 123, Willoughby, Ohio.

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CHAINS. TRACTOR, TRUCK, ROAD GRADER, BUS. Write for circular, give tire sizes, prompt shipment. HORNER TRACTOR SALES, Geneva, Ohio.

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PRE GERMAN SHEPHERD POLICE PUPS. PROTECT your property with good watch dogs. Send 25c for pictures. H. SCHUMACHER, Ottertail, Minn.

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APPLE GRADER. BUILD YOUR OWN. FIVE DOLLARS for complete step by step directions and drawings for a two belt Grader, up to eighty bushels per hour. Use for peaches and tomatoes, too. J. CHAS. MOFFASHED, Redding, Michigan.

COMPLETE ORCHARD EQUIPMENT BOUGHT AND sold. Any used sprayer for your need. 2 specials. Used Buffalo Turbine. New Champion Cider Press. Elec Operated. Big savings on each. If you wish to buy, sell or trade, give complete information in first letter. AGRICULTURAL & INDUSTRIAL SERVICES, Cincinnati Pike, Batavia, Ohio. The Orchard Man's Exchange. All Equipment Guaranteed.

NEW BEAN ROYAL 55 PUMP, COMPLETE, ONE half price. ARNOLD WHITE, RR 1, Traverse City, Michigan.

10 "NEWAY" HYDROMATIC PRUNERS MODEL AB 10-8 with 36" and 2 with 24" extensions plus repair parts and 3 cylinders for above. 2 Skid type sprayers with 500 gallon tank, 55 gallon Bean Royal Pump and Chrysler Industrial Power Units. International T-20 crawler tractor. THEELEN ORCHARDS, Orefield, Pa., located on Route No. 309 about 8 miles north of Allentown.

NEW IRON AGE SPRAYER AT DISCOUNT. ARTHUR ADKIN, South Haven, Michigan.

BRAND NEW SPEED SPRAYER ENGINE, HERCULES JXD, bargain price. Write AMERICAN FRUIT GROWER, Box 122, Willoughby, Ohio.

FOR SALE, MYERS 500 GAL. SILVER KING AIR blast sprayer. W. W. KERCHER & SON, Goshen, Indiana.

MYERS POWER SPRAY ON METAL WHEELS, 100 gallon tank, Novo engine, Niagara Duster, 5 horse air-cooled engine, mounted on skids. Durand Grader for peaches or apples, 100 bushel per hour capacity. All in good condition. H. C. DINWIDDIE, Mayfield, Kentucky.

MODEL 250 IRON AGE ORCHARD TWO WAY Blower Mist Sprayer used as demonstrator. KENNEY MACHINERY CORP., 301 W. Maryland St., Indianapolis, Indiana.

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ORCHARD MANAGER, QUALIFICATIONS. APPLY RAY COPELAND, Clinton, Pa.

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"HOW TO BREAK AND TRAIN HORSES" A BOOK every farmer and horseman should have. It is free; no obligation. Simply address BEERY SCHOOL OF HORSEMANSHIP, Dept. 1582, Pleasant Hill, Ohio.

MISCELLANEOUS

MAKE MONEY ADDRESSING ENVELOPES. OUR instructions reveal how. PAUL GLENWAY, 5713 Euclid, Cleveland 3, Ohio.

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UNITED FARM AGENCY'S NEW FREE SPRING catalog of farm and country real estate bargains—just off press—can help you plan soundly for your future security in the country. Good pictures, many states, easy terms, many equipped, growing crops included. For special service, state requirements, desired location. Write for your catalog today . . . it's free. UNITED FARM AGENCY, 220 AFF South State St., Chicago 4, Ill.

30 ACRES 6 ACRES IN APPLES SOME CHERRIES. M. G. ALLEN, Elgin, Oregon.

350 ACRE APPLE ORCHARD COMPLETELY equipped, 70,000 bushel capacity cold storage, packing room and grader. Three tenant houses and boarding house. MRS. H. K. HITCHINGS, Lafayette, N.Y., R.D. No. 1.

FOR SALE ON EASY TERMS TO EXPERIENCED MAN or lease to experienced man with own equipment, 200 acres with 75 acres of full bearing orchard. Account ill health of owners. L. M. KYER, East Palestine, Ohio, or Wisflo Hotel, Winter Haven, Florida.

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WHITE CHINESE GEESE. CLEAN YOUR BERRY patch, orchard, vineyard. Goose Booklet 10c. Eggs and goose incubators. GOSHEN POULTRY FARM, Goshen, Indiana.

HELM'S PULLORUM CLEAN CHICKS. THIRTY years improvement. Leading breeds, Brown Leghorns hold three world records. Breeding Bulletins Free. ILLINOIS HATCHERY, Metropolis, Illinois.

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WANTED TO BUY

WANTED: UNIMPROVED FARM, RATHER CHEAP. HERBERT AYER, R-1, Newtown, Ohio.

USED AIR BLAST TYPE SPRAYER, WITHIN 300 mile radius of Columbus. Give particulars. BURCH CHANEY, Route 1, South Charleston, Ohio.

MODEL 36 SPEEDSPRAYER, YEAR 1947 OR LATER, two sided. Also heavy duty orchard tractor in rubber. MERRITT HART, Dutchess Turnpike, Poughkeepsie, N.Y.

"He claimed he was the toughest thing in the barnyard 'til he ran up against that BFG Power-Curve tire."

When you use Power-Curve tires on your own tractor, you'll see how tough these B.F.Goodrich tires really are. Power-Curve tires have big, husky cleats that bite into the soil like a spade, give full shoulder-to-shoulder traction. Every turn of the wheel counts because Power-Curve cleats hold firm, reduce slippage. You get full power out of your tractor and save money on your fuel bills. Rugged Power-Curve cleats are evenly spaced so dirt flows down open channels. Power-Curve tires always come up clean with each cleat free to dig in and pull. And they wear longer because there's more rubber in the tread. Pick your toughest tractor work and hand it to Power-Curve tires—made by B.F.Goodrich, First in Rubber.

An advertisement of The B.F.Goodrich Company, Akron, Ohio

STATE NEWS

(*Continued from page 67*)

Harry Wakeman. Their discussion brought out the fact that since the first apples on the market set the pattern for the season, they must be ripe and of good quality. Instances were mentioned where apples were put on the Benton Harbor market a full month before being ripe.

In a resolution passed with only one dissenting vote, the matter of maturity was referred to the new state apple industry committee and a recommendation made that the State Department of Agriculture define the term "maturity" as used in present grading laws and that the department instruct their inspectors to enforce these laws. The society also went on record as favoring more strict enforcement of fruit grading laws.

A one-man crusade to cut down or bulldoze out 10 per cent of Michigan's apple trees is being conducted by grower Otis Klett of Keeler. Klett had cards printed pledging signers "to co-operate with the apple growers of Michigan in relieving the surplus apple situation by removing 10 per cent of my trees," and he hopes to finance trips by Michigan growers to other states to spread the movement. Klett's removal program is aimed at old trees and odd varieties which depress the market.

Officers elected were: President, C. C. Taylor, Albion; vice president, Russel Evarts, Metamora; second vice president, Eric Kerlikowske, Coloma; treasurer, L. A. Spencer, Pullman; and secretary, H. D. Hootman, East Lansing.

ILLINOIS—At a very successful annual meeting of the Illinois State Horticultural Society and the Illinois Fruit Council, held recently in East St. Louis, Lester R. Stone of East Moline was elected president of the two organizations and Curt Eckert of Belleville vice president. Harvey B. Hartline was re-elected secretary of both groups.

The Illinois Fruit Council finished its second year with flying colors. The council which has as its purpose the promotion of Illinois fruits, is financed by grower and commercial memberships on an annual basis. Its major task during 1951 was a trade information program. Crop and market information was supplied the trade in 15 Midwest states in the form of Trade Letters and a Guide Book.

A survey of results made in December showed that the program had directly induced 11 per cent of those supplied this information to become new customers for Illinois fruit and had influenced an addi-

GIANT SIZE

BLUEBERRIES this Year!

For garden . . . for farm . . . Keith's giant ready-to-bear Blueberry bushes are superior. Plant this Spring and pick flavorful berries this summer. Great hardy, heavy rooted, money-making varieties. Low prices. GUARANTEED. FREE Berry Book has bargains in Blueberries, Strawberries, Boysenberries, Raspberries, Shrubs, Fruit Trees. Special grower prices. Write today.

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FRUIT TREES

Buy your trees direct from the grower

Apples	Asparagus
Cherries	Berry Plants
Pears	Grape Vines
Plums	Rhubarb

Write for Price List

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Wholesale Growers

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Evergreen Lining-Out Stock

TRANSPLANTS and SEEDLINGS

Pine. Spruce. Fir. Canadian Hemlock. Arborvitaes, in variety. For growing Christmas trees. Windbreaks. Hedges. Forestry. Ornamentals. Prices low as 2c each on quantity orders. Write for price list. SUNCREST EVERGREEN NURSERIES, Dept. AFG. Box 594, Johnstown, Penn.

DWARF FRUIT TREES

Best heavy-producing varieties, also standard fruit trees, berries, grapes, shade and nut trees, ornamentals. Our thirty-five years experience Guarantees Satisfaction. Write for free catalog.

Tualatin Valley Nurseries, Sherwood, Ore.

Guaranteed Nursery Stock CATALOG FREE

Big 1952 Catalog of Baldwin's Guaranteed Nursery Stock. 60 years' experience. Best varieties of Tree Fruits, Raspberries, Blueberries, Grapes, Asparagus, Roses, Shrubs, Nut Trees. New Brilliant Everbearing and Fairland Strawberries. Reduced prices—Special offers—Cash discounts. Free illustrated catalog. Write today.

O. A. D. BALDWIN NURSERY, Box 39, Bridgman, Mich.

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Varieties Grapes

Specializing in French Hybrids

Schroeder Vineyard

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FRUIT TREES We specialize in growing High Quality Nursery Stock for Fruit Growers. A complete line of Fruit and Nut Trees, Berry Plants, Roses, Evergreens and Flowering Shrubs. Write for colored Catalogue with Money Saving Prices.

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WRITE FOR NEW FREE COLOR CATALOG FOLDER

1. New Almeda—Top Cooking Apple
2. Orient BLIGHT-FREE Pear
3. Chinese Chestnuts
4. Red Flowering Weeping Peach

BOYD BROS. NURSERIES, Dept. F-9

McMinnville, Tennessee

tional 46 per cent in their buying. A total of 4,200 Trade Letters were distributed approximately every two weeks. Growers were aided in this program by financial assistance and advice from the State Division of Markets.

The Trade Promotion Program will be a major effort of the council in 1952.—*Harvey B. Hartline, Sec'y, Carbondale.*

MAINE—A great loss to the agriculture of this state was suffered by the recent death of Dr. Fred Griffee, director of the Maine Agricultural Experiment Station at Orono. His absence will be keenly felt in the research and experimental work of our industry.—*Rockwood N. Berry, Sec'y, Livermore Falls.*

IOWA—Officers of the Iowa Fruit Growers Association for 1952 are: President, R. S. Herrick, Prole; vice president, Claire Williams, Danville; secretary-treasurer, W. H. Collins.

The recent annual convention of the Iowa Fruit Growers Association at Ames devoted one-half day to the grading problem.—*W. H. Collins, Sec'y, Des Moines.*

BALDWIN'S FREE Catalog Will Save You Money

Baldwin's 1952 Catalog of Fruits, Shrubs, Roses, Flowers. Guaranteed Stock, reduced prices, 60 years' experience. New Brilliant Everbearing and Fairland Strawberries. Best varieties Raspberries, Boysenberries, Blueberries, Grapes, Asparagus, Tree Fruits, Nut Trees. Special offers—Cash discounts. Illustrated catalog free. Write today.

O. A. D. Baldwin Nursery, Box 44, Bridgman, Mich.

FOR SPRING PLANTING

New Lindalicious Strawberry plants. Also experimental Strawberry and Raspberry plants without extra charge with every order. 100 other varieties to choose from. Low prices.

Sunny Hill Nursery and Experimental Plant Farms

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All the best varieties of Everbearing and one crop strawberries. Also other small fruit. Northern grown, large healthy plants. Write for price list.

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FRENCH HYBRIDS

The wine and table grapes of the future. We introduced them. We know what varieties are adapted to what regions. Circular.

BOORDY VINEYARD RIDERWOOD, MD.

PEACH APPLE TREES LOW AS 20¢

Pears, plums, cherries, nuts, berries, etc. Grapes 10c. Shrubs, evergreens, shade trees 25c up. High grade quality stock cannot be sold lower. Free 32 page color catalog.

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FOR COMPACT AREA AND EARLY YIELD

Also full line of Fruit Trees, Berry Plants, Vines, Shrubs, Evergreens, Perennials. Write today for FREE CATALOG.

WHITTEN NURSERIES, Box 711, Bridgman, Mich.

NEW GRAPES

New disease resistant hardy grapes. Also new Seedless. No spraying, delicious quality, every home owner can grow them easily. Nut trees, dwarf fruit trees, berries, small fruits. Stock guaranteed. Catalog Free.

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STRAWBERRY PLANTS

Allen's 1952 Berry Book tells best varieties for home and market, and how to grow them. Free copy. Write today.

W. F. ALLEN COMPANY

105 Evergreen Ave., Salisbury, Maryland

NEW ARMORE STRAWBERRY PLANTS

Missouri's new midseason berry. Wonderful size, color & flavor, excellent shipper. 100, $2.00; 500, $8.50; 1,000, $16.00 F.O.B.

SIMS NURSERY FARMS, Hannibal, Missouri

HARDY CLARK DWARF APPLE TREES

13 Select varieties, grown as recommended by Iowa State College. List Free.

Each $3.50; 3 for $10.00

NEW JUNE ROCKHILL STRAWBERRY PLANT PAT. 854

Superb quality—fresh, canned or frozen. Deep rich red—inside and out. Ripens all over—no white tips. Very sweet. Easy to pick. Plants hardy, vigorous and productive. Blossoms perfect. Heavy fruit stems hold fruit off the ground.

NEW! SEPTEMBER RED RASPBERRY DURHAM RED RASPBERRY RED RICH STRAWBERRY

HIBERNAL and VIRGINIA CRAB for top-working apple. OLD HOME PEAR—Small fruits in choice and new varieties.

WHEELOCK WILSON NURSERY

Box 421 Marshalltown, Iowa

FRUIT TREES are Scarce this Year

Newest and best varieties of PEACH, PLUM, APPLE, PEAR, CHERRY, APRICOT and FIG TREES

LIMITED SUPPLY CHOICE STOCK SHOWN IN COLORED CATALOG FREE

BEAUTIFUL 32-PAGE FULL COLOR CATALOG plus Free Planting Guide.

Don't delay, write today. A postcard will do.

CUMBERLAND VALLEY NURSERIES, Inc.

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Kelly's FRUIT TREES

• NOW we issue a New York State Dept. of Agriculture certificate which guarantees our cherry trees to be virus-free. Supplies of fruit trees are limited. It will pay you to order early this season. Our fruit trees APPLES, PEARS, CHERRIES, PLUMS, PEACHES . . . are sturdy, northern-grown stock. Write for FREE CATALOG today.

KELLY BROS. NURSERIES, INC.

Established 1880

156 Maple St., Dansville, N. Y.

Write for big FREE Color Catalog; shows Northern grown FRUIT and ORNAMENTAL TREES, CHINESE CHESTNUT TREES, BERRIES, SHRUBS, PERENNIALS and ROSES. Priced right. Grown on our 600 acres in Dansville. Satisfaction guaranteed.

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MALONEY BROS. NURSERY CO. Inc.

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FRUIT TREES, STRAWBERRY, RASPBERRY AND BLUEBERRY PLANTS

Nut and Shade Trees, Grape Vines, Flowering Shrubs, Evergreens. Over 80 years growing and selling service to planters guarantees satisfaction. New 60 page catalog illustrates, describes our complete nursery line. Write today for your free copy.

Bountiful Ridge Nurseries, Box F-22, Princess Anne, Md.

American
FRUIT GROWER

RICHARD T. MEISTER, *Editor*
Associate Editor, H. B. TUKEY

America's Only "NATIONAL FRUIT MAGAZINE"

There Is a Change in the Wind

THERE is no mistaking the change in thinking among fruitmen this winter. In fact, this change is reflected in Mr. Average Citizen. It is the feeling that we have gone plenty far—too far—in letting Uncle Sam and the other fellow take care of our problems.

As an example, Otis Klett of Hartford, Mich., is conducting a grower campaign to reduce apple acreage. He printed pledge cards at his own expense and then went out to sign up Michigan growers for a 10 per cent voluntary reduction of apple plantings. E. J. Robinette, past president of the Michigan State Horticultural Society, says, "We do not need more regulations. What we need is to live up to what we already have." Erwin Klenk of Sparta, Mich., says, "I try to produce not *more* fruit but *better* fruit." Ernest J. Dowling of New Madison, Ohio, says, "Growers need only to have a mind to work together."

And so it seems to be all over the country—the feeling that we have let things get out of our hands and that we are determined to take a few of them back.

Yes, we have plenty of folks ready to show us how to control prices, how to regulate this, how to regulate that—all at a salary at the taxpayer's expense. But every time we move in that direction we not only lose control but we also learn to lean on the crutch and to become careless and spiritless.

Perhaps the Kefauver investigations had something to do with this reawakening. Perhaps the tax scandals added their bit. But no matter how, there is certainly a rebirth of the old American doctrine, "We must do it ourselves."

The wind is beginning to blow from a different direction. We must keep moving in the direction and at the speed and volume we know it should. This is the only real solution to our problems. Hopefully the winter of 1951-52 is a major turning point.

Fruit Situation at a Glance

	Average 1940-49	1950	USDA Jan. 1, Est. 1952
PRODUCTION			
	Thousand Boxes		
Oranges			
Calif., all	48,196	45,110	42,500
Navels & Misc.	18,273	14,610	14,500
Valencias	29,923	30,500	28,000
Florida, all	46,070	67,300	73,500
Early & Mid-season	25,050	36,800	41,000
Valencias	21,020	30,500	32,500
Other States	4,829	4,400	1,250
Total Early & Midseason	46,358	54,160	56,100
Total Valencias	52,738	62,650	61,150
Tangerines	3,890	4,800	5,000
Grapefruit			
Florida	27,280	33,200	35,000
Texas	17,387	7,580	200
Other States	6,186	5,680	4,740
Lemons	12,993	13,400	12,800
COLD STORAGE HOLDINGS			
	Dec. 31, 1946-50 Average	Nov. 30, 1951	Dec. 31, 1951
	Thousand Bushels		
Apples, Fresh, Total	27,030	28,000	22,821
Pears, Fresh, Total	1,748	2,103	1,358
	Thousand Pounds		
Other Fresh Fruits	41,871	180,403	114,689
Dried & Evaporated Fruits	59,587	38,303	44,437

An Interesting Thought

THOSE interested in fruit juice consumption will be stimulated by the following remark by Robins Russel, manager of Mutual Orange Distributors:

"If the total 1950-51 citrus crops produced in the U. S. were converted to juice, about 1¼ ounces per person per day would be provided. An increase of even one-half ounce per capita would use about 60 million more boxes per year . . . Total present annual citrus production equals about two weeks' consumption of JUST ONE POPULAR CARBONATED SOFT DRINK."

From a nutritional standpoint, how much more healthful it would be if people drank fruit juices instead of the so-called pops. The market is ready-made and technological advances are at a point to assure high quality in canned fruit juices. The question is whether we can organize well enough and sell hard enough to give fruit juices the break they deserve.

Fruit Talk

Karl D. Bailey of **Pontiac, Mich.**, still finds **The Apple Tree** by **Liberty Hyde Bailey**, published in 1922, one of the remarkable books and suggests that more fruit growers should get it out of the library and enjoy it as he does.

Harry A. Schuyler, vice-president of the **Exchange Lemon Products Company** of California, says that of 175,000 tons of lemons handled by his association only 50,000 tons get into high-grade fruit products. Thirty-eight per cent of all the lemons produced in **California** are not shipped into fresh fruit channels. His comment is that there is room only for the best.

"A dual temperature method" of refrigerating **South African plums** transported to the **United Kingdom** is now standard practice according to **A. J. Smith** of **South Africa.** The method is to cool the fruits rapidly to a temperature near 31° F. and hold them on board ship at this temperature for a specified time (usually four to five days), after which the carrying temperature is raised to 45° or 50° F. For fruits which are liable to injury from storage at low temperatures this **"modulated temperature"** practice is highly effective The idea seems to be that at low temperatures a toxic or inhibiting substance is accumulated which injures the fruit but which can be removed at a higher temperature with no impairment of the fruit if accumulation has not proceeded too far.

Based on an index of 100 for the 1910-1914 averages, the average earnings last summer were **560 for industrial workers, 475 for hired farm labor. But** the index value for apples was only 175, though meat stood at 414, tobacco at 438, and cotton at 329.

And if you are further interested, cotton was selling 5.26 cents above parity on July 15 at 39.11 cents a pound, and veal calves brought 32.50 cents a hundred with a parity price of 22.10. **But** oranges on the tree were only 91 cents, with a parity price of 3.69, and apples were 1.93 and 2.88 a bushel, respectively.

Perhaps this is not good horticulture, but the definition by **Winston Churchill** of the difference between the conservative and socialist outlook is at least a nice turn: "The difference is between the **ladder** and the **queue.** We are for the **ladder**—let all try their best to climb it. They are for the **queue**—let each wait in his place until his turn comes."

Among the new books is **Insect Control by Chemicals** by A. W. A. Brown of the University of Western Ontario, London, Canada, published by John Wiley and Sons. Anyone looking for complete information on the chemical nature of insect control including the compounds and the way insecticides kill will find it here. It comprises 817 pages, thoroughly up-to-date.

—H.B.T.

Coming Next Month

- Orcharding Is Such Fun!
- California—Number 1 Strawberry State
- The Garden Tractor—A Fruit Grower's Friend
- Adjusting the Apple Industry
- Can You Tell the Difference Between a Fruit Bud and a Leaf Bud?

EASY TO LOAD. Your Dodge "*Job-Rated*" Farm Truck will help to take a lot of the grunt and groan out of loading and unloading. It has a low ground-to-floor height, for instance. Most stakes have hinged center sections.

How farmers make hauling jobs a lot easier

Farmers everywhere are finding their hauling jobs a lot easier with Dodge "*Job-Rated*" Farm Trucks.

You'll find your Dodge easier to load and unload—easier to handle in close quarters—easier to drive on or off the highway.

It'll carry a bigger load for you . . . and take you to town in easy-chair comfort. You'll like the wide, "family-size" seat and the big, safe-vision windshield that lets you see more of the road ahead!

Next time you're in town, drop in to see your Dodge dealer. Ask him to tell you more about a Dodge "*Job-Rated*" pick-up, stake, or other farm truck that will make your hauling jobs easier.

EASY ON THE DRIVER... EASY ON THE TRUCK

You never saw a truck so easy to handle. Sharper turning is made possible by short wheelbase and wide front tread. Your truck will be "*Job-Rated*," too—engineered *at the factory* to fit your farm. On ½-, ¾-, and 1-ton models you can get gyrol Fluid Drive that makes driving still easier.

EASY ON THE POCKETBOOK... EASY TO BUY

Fewer stops for gas, due to high-compression engine. And upkeep stays down, thanks to exhaust valve seat inserts and other features. Yet Dodge "*Job-Rated*" Farm Trucks are priced with the lowest. For small down payment and low monthly payments, *you* can own one, too.

DODGE "Job-Rated" TRUCKS

STOP

CHERRY FRUIT FLY

and FRUIT WORM

WITH DU PONT "MARLATE" Insecticide

SURE PROTECTION EARLY AND LATE. The same "Marlate" sprays control both these destructive insects and help you get clean fruit for market or cannery.

MINIMUM RESIDUE PROBLEM. Use "Marlate" for late-season control without residue hazards. For exceptional coverage of fruit, add Du Pont Spreader-Sticker to the spray mixture.

CONTROLS OTHER INSECTS. "Marlate" kills Oriental fruit moth, plum curculio, destructive prune worm, codling moth, apple maggot, Japanese beetle, leafhoppers and other major insect pests of fruit.

IDEAL FOR OTHER FRUITS. "Marlate" solves the residue problem with early apples, peaches, plums and the like. "Marlate" also has many advantages for insect control on vegetables, forage and seed crops.

See your dealer now *for "Marlate" and other proved Du Pont pest-control products. Ask him for free booklets, or write Du Pont Grasselli Chemicals Dept., Wilmington, Del.*

DU PONT CHEMICALS FOR THE FARM INCLUDE: *Fungicides:* PARZATE® (Liquid and Dry), FERMATE®, ZERLATE®, Copper-A (Fixed Copper), SULFORON® and SULFORON®-X Wettable Sulfurs . . . *Insecticides:* DEENATE® DDT, MARLATE® Methoxychlor, LEXONE® Benzene Hexachloride, KRENITE® Dinitro Spray, EPN 300 Insecticide, Calcium Arsenate, Lead Arsenate . . . *Weed and Brush Killers:* AMMATE®, 2,4-D, TCA and 2,4,5-T . . . Also: Du Pont Cotton Dusts, Du Pont Spreader-Sticker, PARMONE® Fruit Drop Inhibitor, and many others.

®REG. U. S. PAT. OFF.

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

DU PONT
MARLATE®